DECEMBER 17, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

PITFALL IN PRICING
—Capehart Amendment May Hurt, p. 61

METAL BONDING
—Stronger, Smoother Assemblies, p. 90

LOWER HARDENING COSTS
—RF Heating Saves $70,000 per Year, p. 97

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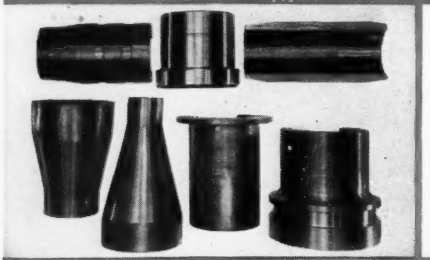
Clear Signal for

Railroads

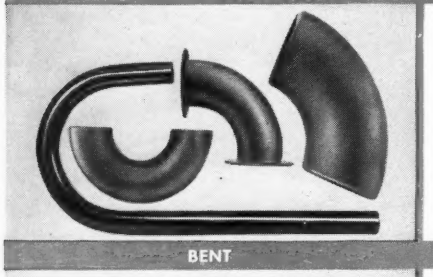
Financing, Materials Problems May Bring 'Slow Order'—p. 64

SPUN

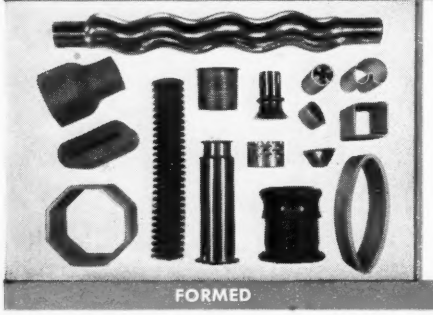


UPSET

SWAGED and EXPANDED



BENT



FORMED

let's take a CLOSER LOOK at Fabrication Requirements

If you make hollow parts the economical way—from tubing—chances are you have one or more fabricating problems. This typical array of parts illustrates the wide range in severity of working that is involved in such operations as spinning, swaging, expanding, upsetting, bending, and forming. A corresponding diversity exists in the type, grade, finish, and mill condition of seamless and welded steel tubing used for their manufacture.

Remember, tubing is more than bar stock with a hole in it. It is a semi-finished product. B&W's ability to match its tubing to a myriad of end uses may enable you to make a better product . . . easier. Ask Mr. Tubes—your B&W Tube Company Representative—for help in selecting the tubing that is best for *your* fabricating requirements. Request a copy of Bulletin TB-324.

TA-1641-H

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY

Executive Offices: **Beaver Falls, Pa.**

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Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas • Los Angeles 17, Calif. • New York 16, N.Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Calif. • Syracuse 2, N.Y. • Toronto, Ontario • Tulsa 3, Okla.

Under the provisions of the revised building code of the City of Los Angeles, lightweight steel construction and hollow steel floor panels were used to advantage in the new Tishman office buildings. Bethlehem Pacific fabricated and erected the steelwork.

12-Story Triplets for Tishman

These three modern office buildings are being erected on Los Angeles' celebrated Wilshire Boulevard for Tishman Realty and Construction Company of New York. The buildings are identical, limit-height structures. They will provide some 600,000 sq ft of office space in a highly desirable location just west of the Ambassador Hotel.

The structural steel frames of these buildings are unusually light, weighing only 11 lbs per sq ft of floor area. Under the modern building code of the City of Los Angeles, cellular light-gage steel floor panels were used as diaphragms to resist seismic forces. Suspended ceilings and vermiculite plaster were used to envelop the steel beams for fireproofing instead of the massive concrete encasement required by earlier building codes. This materially reduced the dead load, cut construction costs, and saved erection time. A reinforced-concrete central utility core extending up through each building provides all services, including elevators and air-conditioning. Windows occupy three-quarters of the exterior wall surface of each building.

Bethlehem Pacific fabricated and erected the steelwork for the three Tishman office buildings. The architect is Claud Beelman; Herman Spackler is associate architect; engineers are Brandow and Johnson; general contractor is C. L. Peck—all of Los Angeles.

BETHLEHEM PACIFIC COAST STEEL CORPORATION
General Offices: San Francisco

BETHLEHEM STEEL

BETHLEHEM PACIFIC

"BEST BY ANY TURNING TEST"
in the toolroom and on the production line.
Write to Dept. 710 for complete information
and performance data.

Jones & Lamson turret lathes are BUILT and

POWERED TO PRODUCE

MORE CHIPS **per tool**
MORE PIECES **per hour**
MORE PROFIT **per job . . . than any turret lathe of comparable size!**

Turret Lathe Division **JONES & LAMSON** MACHINE COMPANY
Springfield, Vermont, U.S.A.

MACHINE TOOL CRAFTSMEN SINCE 1835

Look into this mirror for faster production

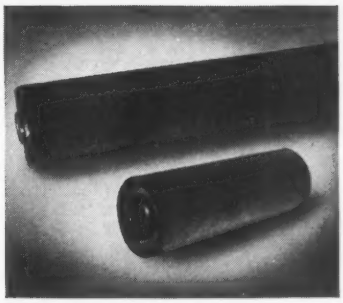
A brushing method used by a mirror manufacturer . . . or one similar to this . . . may help you improve product quality and cut rejects.

To provide a binder for the silvering compound, a base coat was formerly applied to the glass by hand. But uneven coating caused blemishes in the silver after drying. With the help of the **O**sborn **B**rushing **A**nalyst, a power brushing method with specially-engineered Osborn Heli-Master® Brushes was developed (1) to clean the glass thoroughly with water and (2) to *brush on* the base coat in a perfectly uniform film. Results: Blemishes in silvering practically eliminated. Mirror production has been stepped up and rejects cut to the bone.

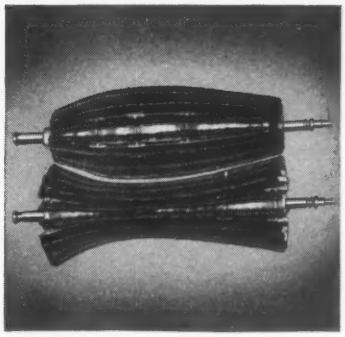
Look into the possibilities of power brushing for the improving of *your* manufacturing . . . whether it involves glass, metal, rubber, plastics or textiles. To get the help of an **OBA**, call or write *The Osborn Manufacturing Company, Dept. 580, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN

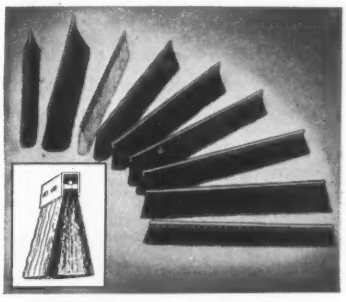
LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



FOR HIGH SPEEDS. Osborn Heli-Master® "FA" Brushes provide a continuous, uniform density of fill up to a 180″ brush face length. These can be built for many types of cleaning, scrubbing and finishing for smooth operation at speeds up to and exceeding 10,000 surface feet per minute. In wide range of fill materials for metallic and non-metallic materials.



FOR FLEXIBILITY. Osborn Rota-Master® Brushes may be used for wide-face applications such as glass washing, cleaning and unloading conveyor belts, wood staining, bus washing, rubber roughing, power sweepers. Open face design affords flexibility. Density is regulated by the number of Master strips employed.



FOR MANY JOBS . . . Osborn Master* Strip Brushes can be used in special mountings for a wide variety of power-driven applications—in straight strips or wound on an arbor as for the Heli-Master or Rota-Master Brushes. Have the **O**sborn **B**rushing **A**nalyst show you how these versatile brushes can help solve *your* problems.

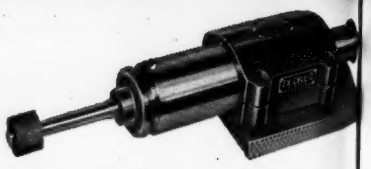
*Trademark

The Spindle You Want

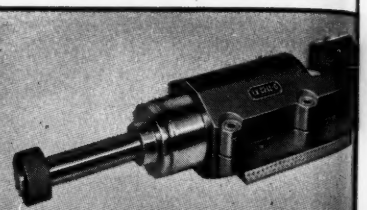
In This Complete Catalog

For speed, precision, endurance, your best choice is an Ex-Cell-O Grinding Spindle. You'll find one to suit your needs in the big, 80-page Ex-Cell-O Catalog 25962, supplied with price list on request.

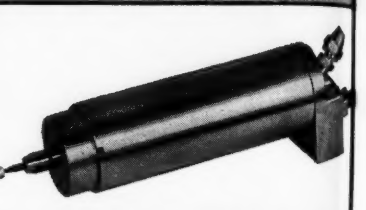
● Leading grinder manufacturers install Ex-Cell-O Precision Spindles as original equipment. You can improve the performance of your grinders with Ex-Cell-O Precision Spindles. They are rigid and smooth-running, permit heavy cuts without chatter, require no lubrication or adjustment. All are fitted with precision ball bearings manufactured by Ex-Cell-O.



Single-body, belt-driven internal grinding spindle

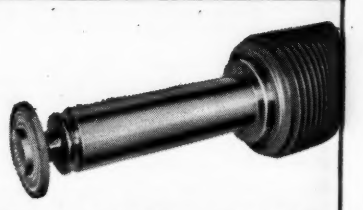


Double-body, belt-driven internal grinding spindle

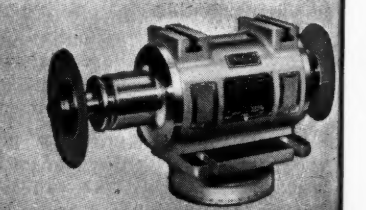


65,000 rpm high frequency inbuilt motor spindle

25,000 rpm high frequency inbuilt motor spindle

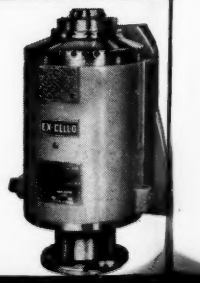


Totally enclosed inbuilt motor surface grinder spindle



Precision inbuilt motor spindle for cutter grinder

Vertical precision spindle with inbuilt motor.



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MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS
RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT
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XLO
EX-CELL-O for PRECISION

STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 25 DECEMBER 17, 1951

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Next Week ... **Toy Production—Big Operation on a Miniature Scale ... Stainless Steel Foundry Conserves Critical Alloys ... Small Companies Build Solid Defense Production Record**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

Smoother Finish Longer Tool Life

with

PELRON Cutting Oils

Here's what production men have been praying for—cutting oils that will give smoother and freer removal of metal, with cooler operation and longer tool life.

PELRON CUTTING OILS, developed through extensive research following the newer theories of water soluble cutting oils, have the unique property of breaking loose successive globules of oil at the point of extreme pressure for extra lubrication. Once past the pressure point, or inter-face of the tool, PELRON cutting oils immediately go back into a stable emulsion. This characteristic accounts for the unusually smooth cutting action, the prolonged tool life and all-round improved machine operation.

PELRON CUTTING OILS are clear, light amber and remain so, giving good visibility at the work point. They form a complete and permanent emulsion with water of any type and hardness.

They settle chips readily in the system, prevent rancidity, odor, or deterioration. In fact, they can be used for months on cast or malleable iron with no rusting, odor, or breaking down of the emulsion.

ISN'T THAT WHAT YOU'VE BEEN PRAYING FOR?

Contact our nearest sales office for a sample and demonstration. Our metal processing experience and engineers are at your service. Let's hear from you.

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7740 W. 47TH STREET
LYONS, ILLINOIS

Sales offices: Chicago • Detroit • South Bend
Cleveland • Milwaukee • Indianapolis • Rock Island

Behind the Scenes . .

Sound the Trumpets

The typewriters are clacking, the calculating machines whirring, the telephones ringing at a furious pace these days up on the ninth floor. The increased tempo is caused by the Yearbook Issue which will be on your desks Monday morning, Jan. 7, 1952.

From what we can gather, the issue will be a super-duper this year. It will contain these four major sections: A penetrating analysis of metalworking's destiny that will touch on the somber conditions as well as the brighter landscape you can expect along the road to tomorrow; grass-roots interviews of men in all branches of industry to find out the basic metalworking problems and how executives expect to cope with them; a forum on technical progress where 150 leading engineers and metallurgists will report on what's ahead technically; a 48-page section presenting an outstanding compilation of statistics covering every phase of metalworking. Those statistics won't give the median age for shipping clerks in industry, but they will present useful, logically assembled data that can help you for one year to come.

In addition to those main features, the editors have in the works a complete, up-to-date compilation of the government controls affecting materials, components and equipment. That's an extension and roundup of STEEL's weekly service on controls. What's more, a four-page fold-out insert will tell you whom to contact in Washington. Besides all that, a special article will report on what to expect from Washington in 1952; another will show how the auto industry is turning to war work. A chronology is also being compiled of major industrial events during 1951, plus a calendar of meetings and conventions thus far scheduled for 1952.

Sample Specs

In the Bulletin of the Conveyor Equipment Manufacturers Association appears this sample set of specifications:

Scope: Furnish all labor and materials required to erect building on the site chosen. Building is to extend to property line on all four sides, and to be carried up to a height consistent with the load-bearing capacity of the soil.

Payment: Payments will be made on the first of each month, an amount equal to the contractor's anticipated disbursements for said month, plus 15 per cent.

Excavation: A hole shall be dug to accommodate the building. It shall be slightly on the small side to permit a snug fit and thus minimize vibration.

Foundations and Concrete: Concrete footings of aesthetic proportions shall be poured prior to starting superstructure.

Structural Steel: Structural steel framework shall conform to architectural requirements. Columns are to be located in corners; where this is not possible, use cantilevers. Floors and ceilings shall be kept clear of all structural members to be unaffected by deflection in any way.

Masonry: Bricks to be laid with careful deliberation. Joints to be filled, thoroughly, only in the presence of architect's representative. After walls have been erected, apply generous coating of pitch to exterior surface, so that splashing and pitch stains by the roofer will not be noticeable.

Tenders: Tenders must be submitted not later than 2 p.m. next month. In the case of identical tenders, duplicate awards will be made; that is, two or more buildings will be erected.

Cover Story

The handsome layout on the cover this week was dreamed up by Artist Robin Allen. The picture was contributed by American Car & Foundry Co. A lot of railroad equipment builders responded to the editors' requests for photographs, including Pressed Steel Car Co. Inc., Pacific Car & Foundry Co., Fairbanks, Morse & Co., Baldwin-Lima-Hamilton Corp., Bethlehem Steel Co., Electro-Motive Division of GM, American Locomotive Co. and Pullman-Standard Car Mfg. Co.

Some of those photos appear in connection with the railroad story to which the cover refers. Chicago Editor Erle Ross wrote the article.

Puzzle Corner

The clock in the Dec. 3 puzzle takes 10.5 seconds to strike 10 if it takes 7 seconds to strike 7. First in with that answer were T. S. Bean of Barber & Ross Co., Robert W. Huff of Canton, O., and Laurence McKinney of James McKinney & Sons Inc.

If one-third of six were three, what would one-fourth of 20 be?

Shrdlu

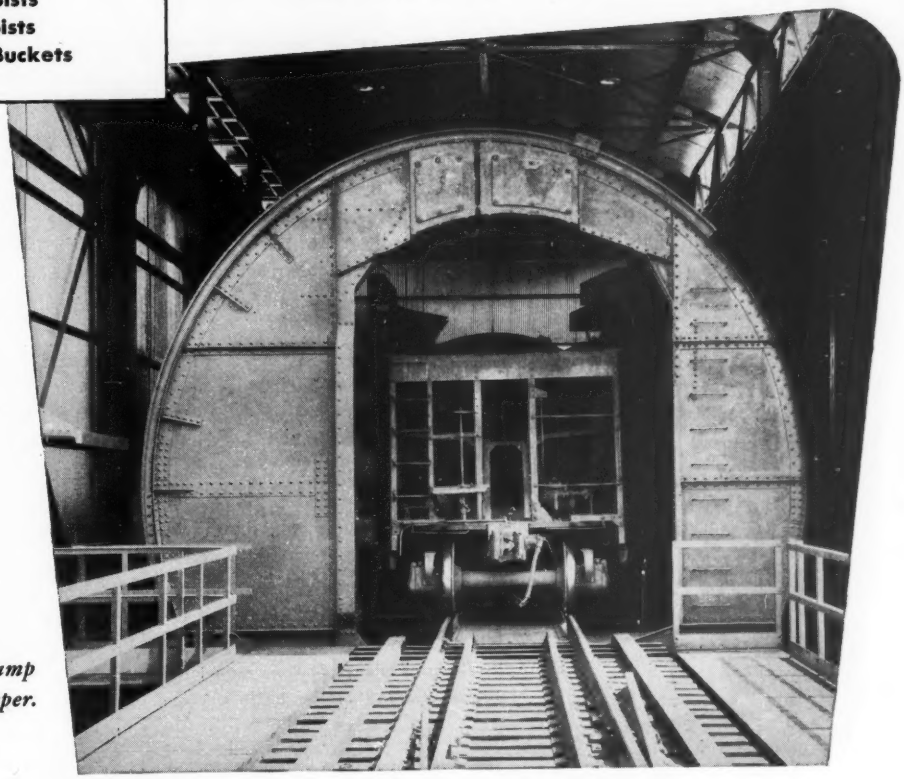
(Metalworking Outlook—Page 53)

Wellman will build it

- Special Cranes
- Car Dumpers
- Gas Producer Plants
- Ore Bridges
- Charging Machines
- Forging Manipulators
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Clamshell Buckets

WELLMAN Car Dumpers

Select the right dumper from the most complete line

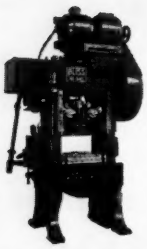


Wellman 60' 4-clamp Revolving Car Dumper.

• The complete line of Wellman Car Dumpers includes Lifting, Turnover, Traveling and Revolving Types. The Revolving Type is an example of Wellman's engineering skill. It is self-contained, requiring no external structures. A rack segment and pinion at each end of the frame turns each end equally, preventing distortion of the frame.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO



High Production

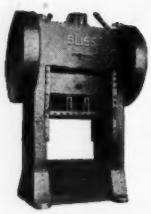
Toggle Drawing

Coining and Embossing

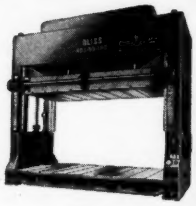
Hobbing

FROM THE RIGHT PRESS

FOR A GIVEN JOB TO A COMPLETE PRESS ROOM... It's Bliss!



Double Crank



Die Spotter

There can be only one *right* press for a given job. When all factors are weighed: cost...quality of stampings...maintenance...adaptability—one will emerge as the *right* press.

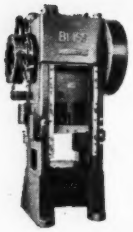
It's logical to call on Bliss for press recommendations because:

Bliss builds more types of presses—mechanical and hydraulic—than any other company in the world.

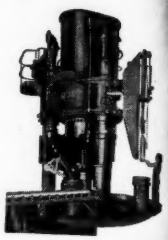
Bliss builds the full range of automatic feeding, indexing and ejecting devices to obtain the maximum press output.

Bliss has the engineering experience—over 90 years of it—in designing equipment for the forming, drawing and extrusion of steel, copper and brass...for light and powdered metals.

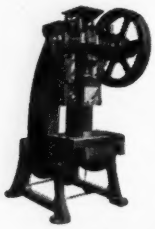
Whether it's a single press for a given job or a complete stamping plant, Bliss engineers welcome your inquiry. They will help you on methods, production rates and costs without obligation.



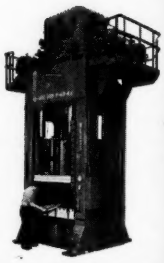
Single Crank



Heading



Inclinable



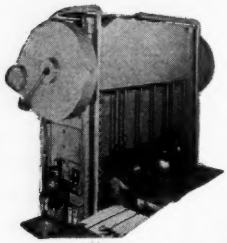
Double-action Hydraulic

E. W. BLISS COMPANY, CANTON, OHIO

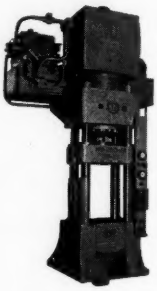
E. W. Bliss Company (England) Ltd., Derby, England

E. W. Bliss Company (Paris), St. Ouen sur Seine, France

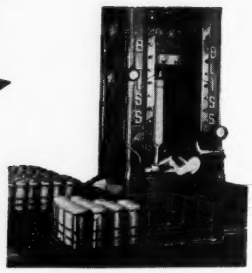
Presses, Rolling Mills, Special Machinery



Rail Forming

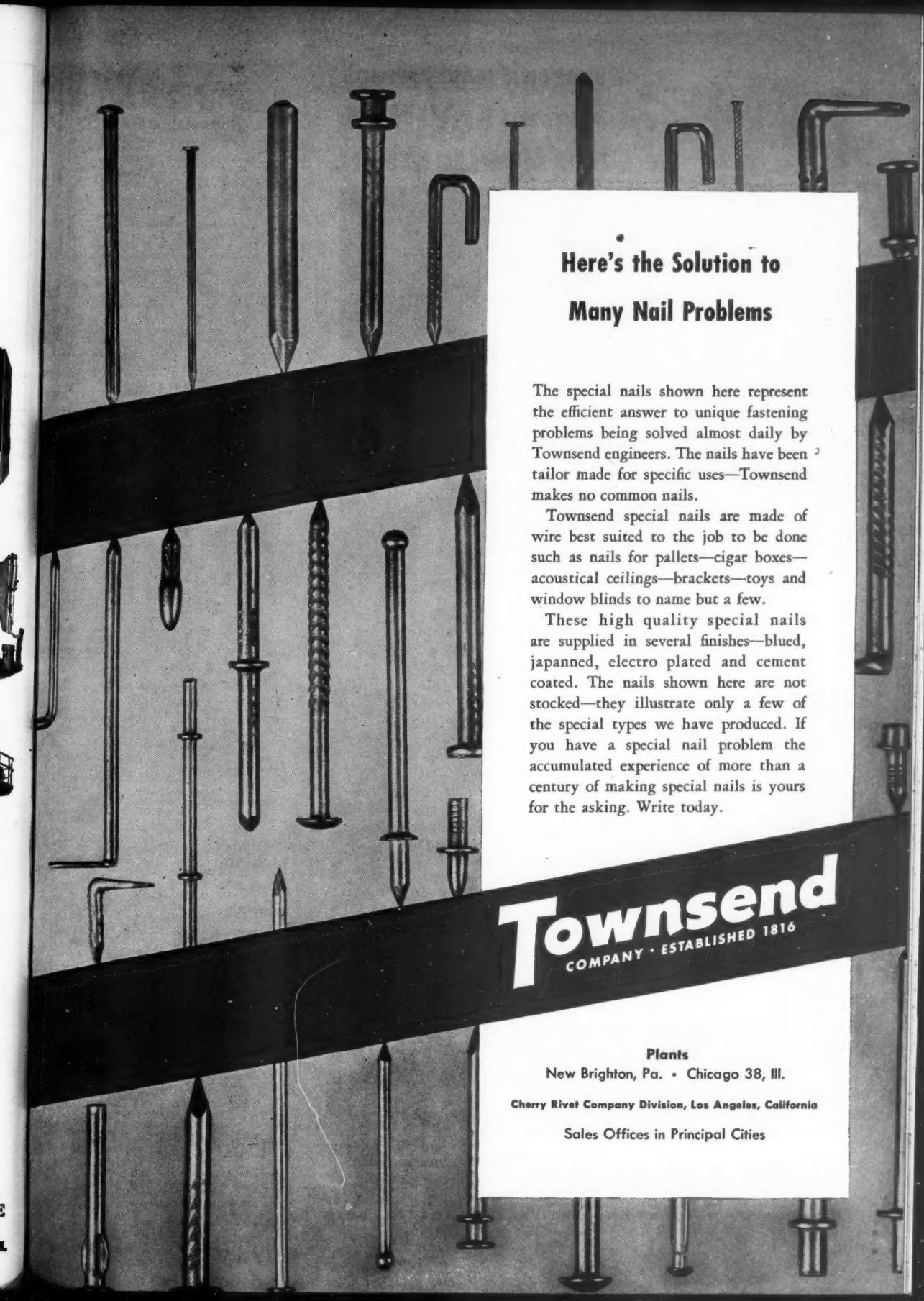


Hydraulic Open Rod



Hydraulic Redraw

BLISS ON YOUR PRESS IS MORE THAN A NAME...IT'S A GUARANTEE



Here's the Solution to Many Nail Problems

The special nails shown here represent the efficient answer to unique fastening problems being solved almost daily by Townsend engineers. The nails have been tailor made for specific uses—Townsend makes no common nails.

Townsend special nails are made of wire best suited to the job to be done such as nails for pallets—cigar boxes—acoustical ceilings—brackets—toys and window blinds to name but a few.

These high quality special nails are supplied in several finishes—blued, japanned, electro plated and cement coated. The nails shown here are not stocked—they illustrate only a few of the special types we have produced. If you have a special nail problem the accumulated experience of more than a century of making special nails is yours for the asking. Write today.

Townsend
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Plants
New Brighton, Pa. • Chicago 38, Ill.

Cherry Rivet Company Division, Los Angeles, California

Sales Offices in Principal Cities

SOLVED BY NELWELD

TRANSFORMER MAKER FINDS *Continuous* SAVINGS IN STUD APPLICATION

Split-second welding of studs to distribution transformer housing. Note ease with which operator uses portable Nelweld gun to weld to plate.

Continuous production savings — in fabricating time, in materials used and in release of production equipment—describes the Nelweld advantages gained by a manufacturer of power transformers.

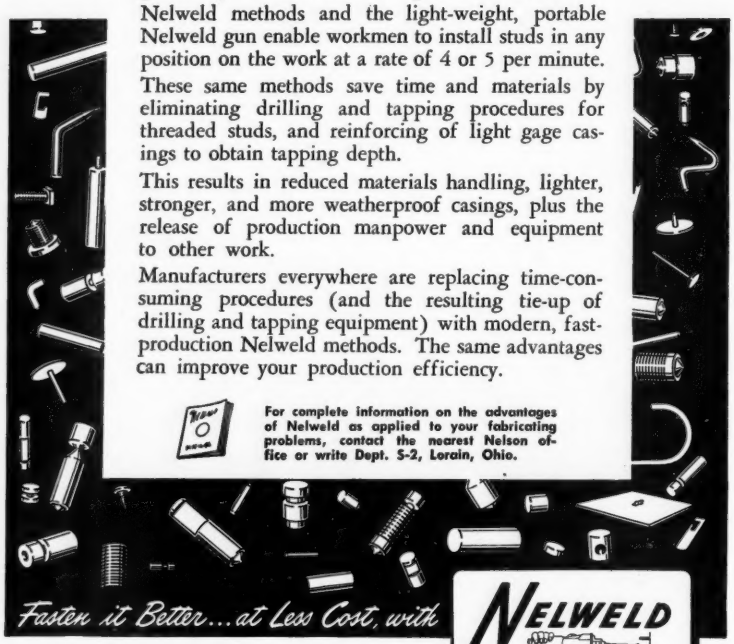
Nelweld methods and the light-weight, portable Nelweld gun enable workmen to install studs in any position on the work at a rate of 4 or 5 per minute.

These same methods save time and materials by eliminating drilling and tapping procedures for threaded studs, and reinforcing of light gage casings to obtain tapping depth.

This results in reduced materials handling, lighter, stronger, and more weatherproof casings, plus the release of production manpower and equipment to other work.

Manufacturers everywhere are replacing time-consuming procedures (and the resulting tie-up of drilling and tapping equipment) with modern, fast-production Nelweld methods. The same advantages can improve your production efficiency.

For complete information on the advantages of Nelweld as applied to your fabricating problems, contact the nearest Nelson office or write Dept. S-2, Lorain, Ohio.



NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

STEEL

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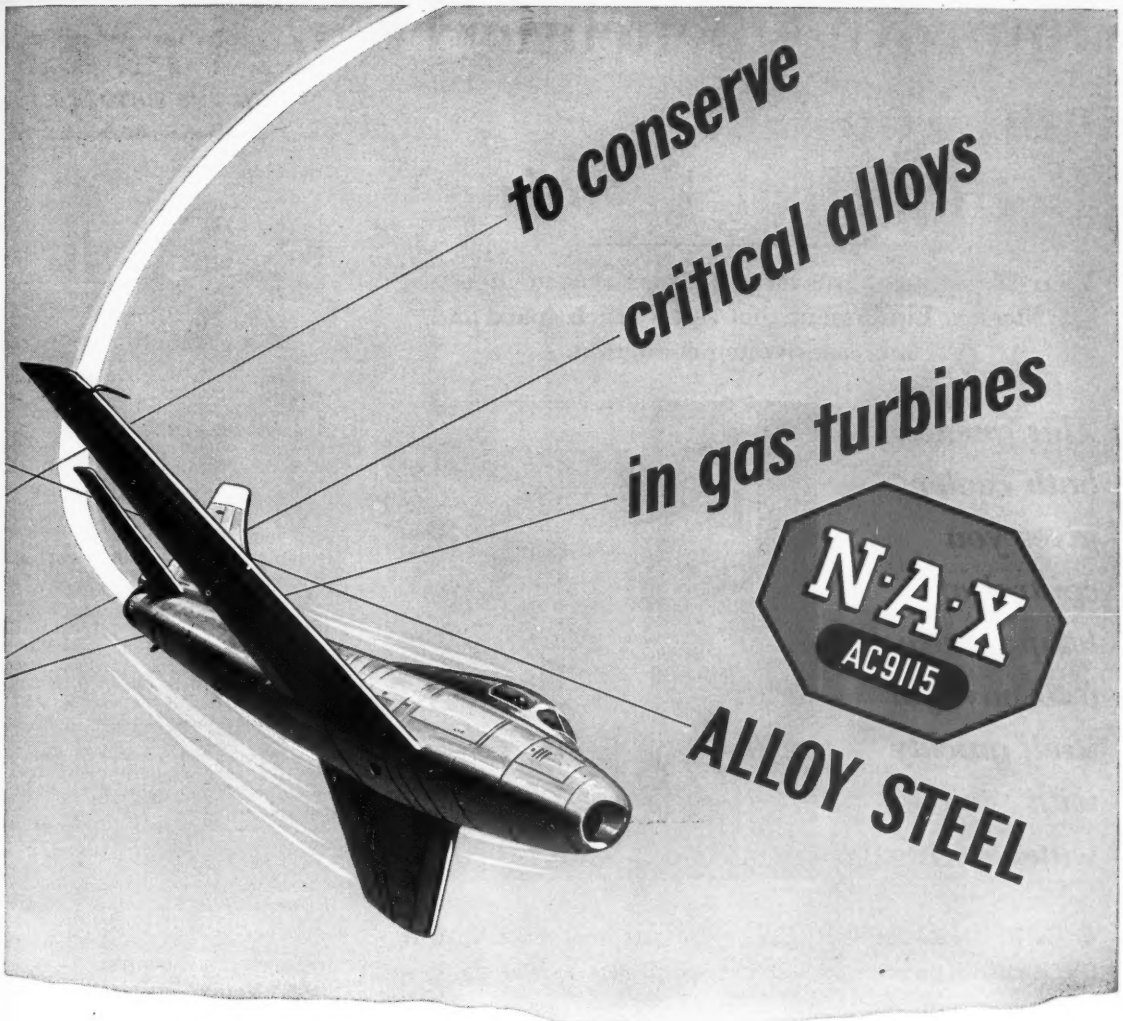

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N-A-X AC9115 ALLOY STEEL has high strength and toughness values at temperatures ranging from −70° F. to +1,000° F. It can be readily cold formed into the most difficult shapes; its response to welding by any process is excellent. It must, however, be suitably coated for protection against cold or hot corrosion.

Investigate the outstanding properties and characteristics of N-A-X AC9115 ALLOY STEEL and, through its use, conserve the critical material so necessary to our nation.

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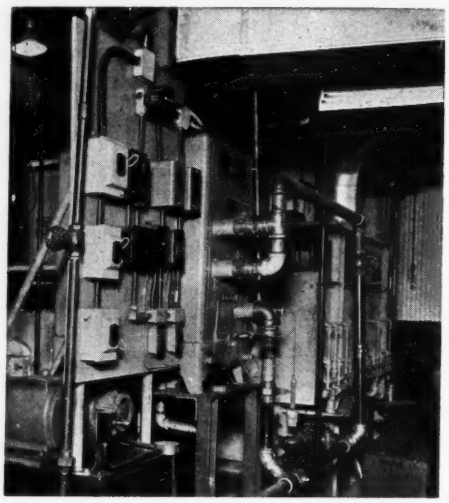
Your Department can have a better arrangement with Niagara Equipment that saves much space and increases your production.

This quench bath cooler gives you control of temperature and pays for itself quickly with water savings



● The NIAGARA AERO HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air by evaporative cooling. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara Aero Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletin 96.

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Experienced District Engineers in all Principal Cities

LETTERS
TO THE EDITORS

Canadian Offer

Re your article on machine tool subcontracting (Nov. 19, p. 70), how can we offer our facilities to this program? We cannot build complete machines, but on certain subassemblies and bits and pieces, we might be of considerable help.

G. W. Phelps
engineering department
Otaco Ltd.
Orillia, Ont.

● *Contact the major machine tool builders directly.*

Helpful Handbook

As soon as it's in print we'd like to obtain a copy of the handbook mentioned in an article (Nov. 19, p. 118). Title and subject of the article: "ASTE Handbook on Dies. Metal stamping dies will be classified according to accuracy specifications and production volume. Handbook was compiled by American Society of Tool Engineers' book committee."

C. Spelman
Fred Goat Co. Inc.
Brooklyn, N. Y.

● *Write to American Society of Tool Engineers, 10700 Puritan Ave., Detroit 21.*

Stretching the Supply

We would like to run your story "Stretch Your Steel Supply" in the *Heart of America Purchaser.*

Our publication reaches the purchasing agent of practically every rated manufacturer in the Western two-thirds of Missouri, all of Kansas, and adjacent sections of Oklahoma-Arkansas and Iowa-Nebraska.

Ray Shannon
Ray Shannon & Associates Inc.
Publisher, *Heart of America Purchaser*
Kansas City, Mo.

● *Permission granted.*

Who and Where Department

You made reference to a new vinyl chloride plastic shroud 0.008-in. thick used by Army Ordnance for protecting outside storage (Oct. 15, p. 75).

Can you give us the name of the supplier of this product?

David P. Delano
assistant purchasing agent
Reed & Prince Mfg. Co.
Worcester, Mass.

● *The vinyl chloride plastic shroud was made by National Transparent Plastics Co., Springfield, Mass. Since the work was done for the Army Ordnance Corps, it represents joint efforts of these manufacturers: Monsanto Chemical Co., Shell Oil Co., and Marvellum Paper Co.*

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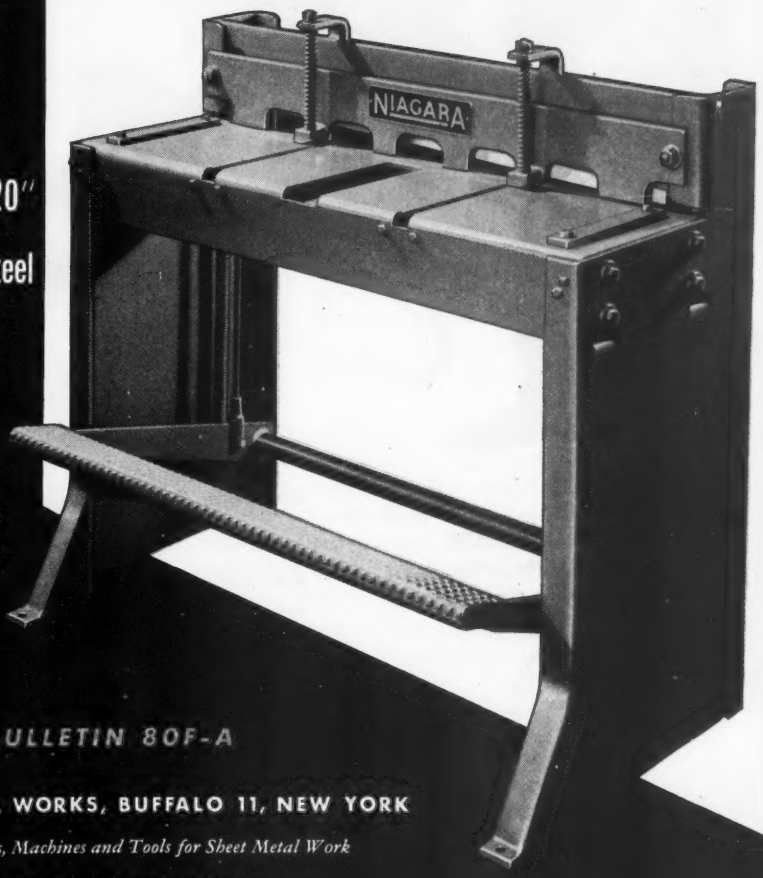

Write for the facts on how America's most modern foot shear will help you save time and cut costs.

ASK FOR BULLETIN 80F-A

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DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

Let's go...let's get that SCRAP in!

All your SCRAP is urgently needed, NOW

THE scrap shortage is serious. *Your* scrap—every pound of iron and steel scrap you can locate in your plant or factory—is vitally needed and needed right away. For unless you do everything possible to get this scrap on its way to the mills, steel production is bound to slow up. That can't be allowed to happen. But without your help it surely will.

It takes at least one-half ton of scrap to make one ton of steel. With the mills turning out more than 2 million tons of steel per week, over 1400 carloads of industrial scrap are needed *every day*. And industry, somehow, must provide it.

What you can do to meet this emergency

First, organize a permanent Scrap Salvage Committee and make the "drive-for-scrap" part of your daily operations. Search out every possible source of scrap. Turn your old and worn-out equipment, tools and machinery over to your scrap dealer, at once. Dig out your discarded dies, rusted-out tanks and boilers, your old rails and other miscellaneous junk, and start them back to the mills through your scrap dealer. Encourage every employee to report every retired or obsolete machine that now stands idle—see that it is turned in for scrap.

By getting this "dormant" scrap off your premises and into the furnaces you'll be helping not only yourself but America as well. *More* scrap turned in, means *more* steel turned out—it's as simple as that. So let's get going.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

This page would ordinarily be used to tell you about

AMERICAN MANUFACTURERS WIRE

but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
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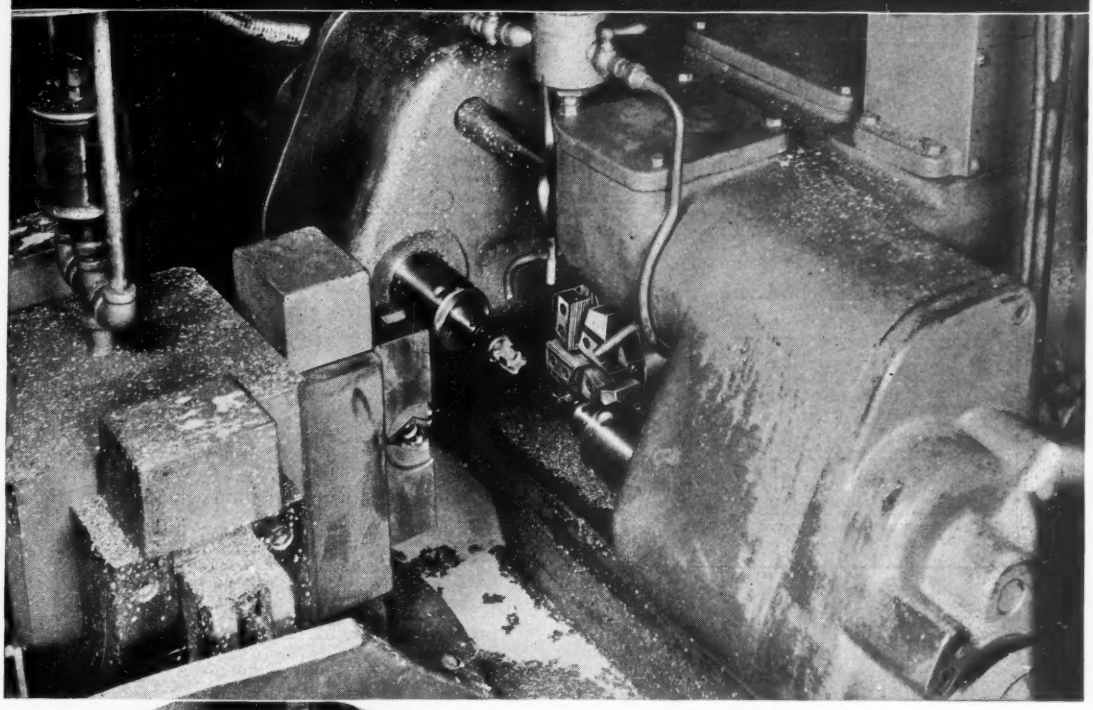
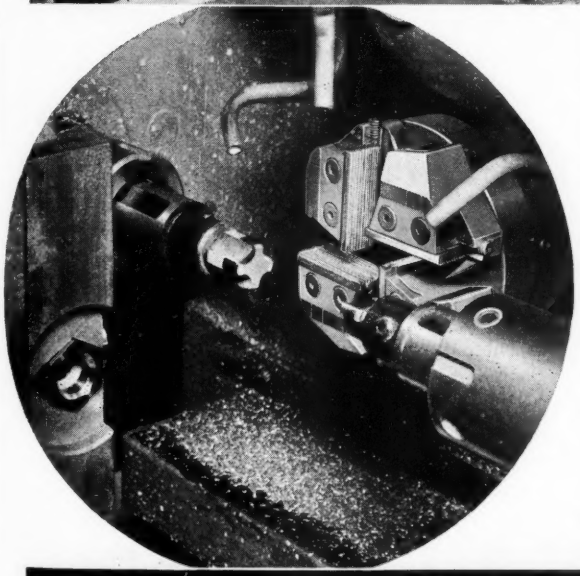
UNITED STATES STEEL

57% Less Threading Cost

ON AUTOMATIC CHUCKING MACHINE





A *LANDIS* Solid Adjustable Die Head cut the cost of one threading operation in the plant of a large Middle Western manufacturer by 57%.

The operation, performed on a Goss and DeLeeuw Automatic Chucking Machine, required the cutting of a 1 11/16" diameter 14 pitch thread ½" long on cast brass valve bodies. Prescribed tolerances were easily maintained.

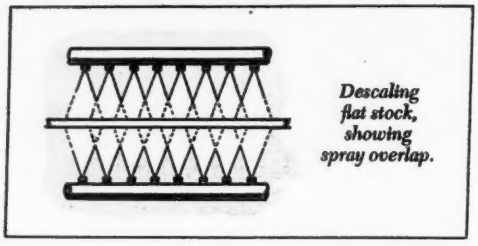
The *LANDIS* Head fit perfectly into the highspeed cycle of the chucking machine, and produced an average of 210 finished pieces per hour, revolving at 385 RPM. Major factors in the efficiency of this *LANDIS* Head were low down-time and low tool cost, occasioned by long tool life. Output of finished pieces averaged from 4,000 to 5,000 between chaser grindings.

Please send job and machine specifications with your request for additional information.

LANDIS *Machine* COMPANY WAYNESBORO PENNSYLVANIA

HYDRAULIC DESCALING IS FAST, CHEAP AND EFFECTIVE

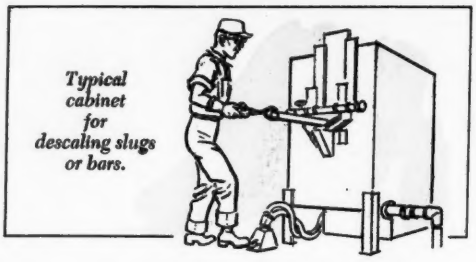
SCALE which forms when metal is heated during production can become a problem if it is not properly removed. Scale can affect the size, weight and quality of your finished product. Scale can cause unnecessary wear on your cutting tools, punches, dies and machinery.



Descaling flat stock, showing spray overlap.

Effective descaling need not be a slow, costly manual or mechanical process. With hydraulic descaling you can efficiently knock off scale with high velocity jets of water in a matter of seconds!

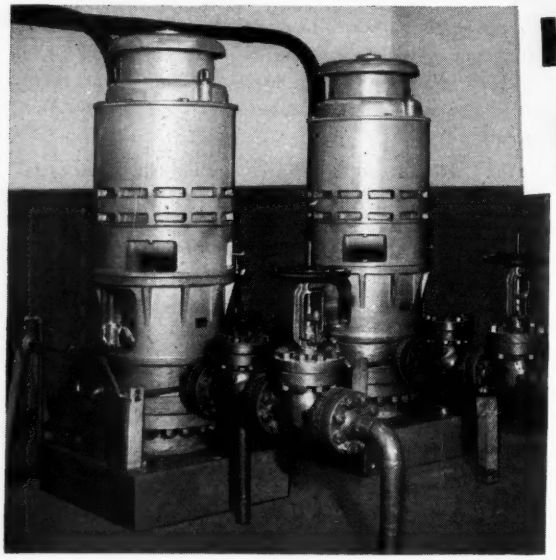
The heart of the hydraulic system is the pump which delivers the high pressure water. The BJ Hydropress pump is ideal for this type of work because of its unique construction features. It does not require relief valves, accumulators or extra heavy fittings and piping. Its double volute design creates inherent balance at all heads and capacities.



Typical cabinet for descaling slugs or bars.

Its vertical construction allows the use of a simple foundation and a minimum of floor space.

For more information on how BJ may solve your pumping problems, call your local BJ sales engineering office today!



BJ HYDROPRESS PUMPS ARE YOUR ANSWER

These BJ Hydropress pumps provide capacities to 300 gpm and pressures to 3000 psi. One pump can serve a number of descaling cabinets or booms.

Write for BJ Hydropress Bulletin No. 48-6400. No obligation, of course.

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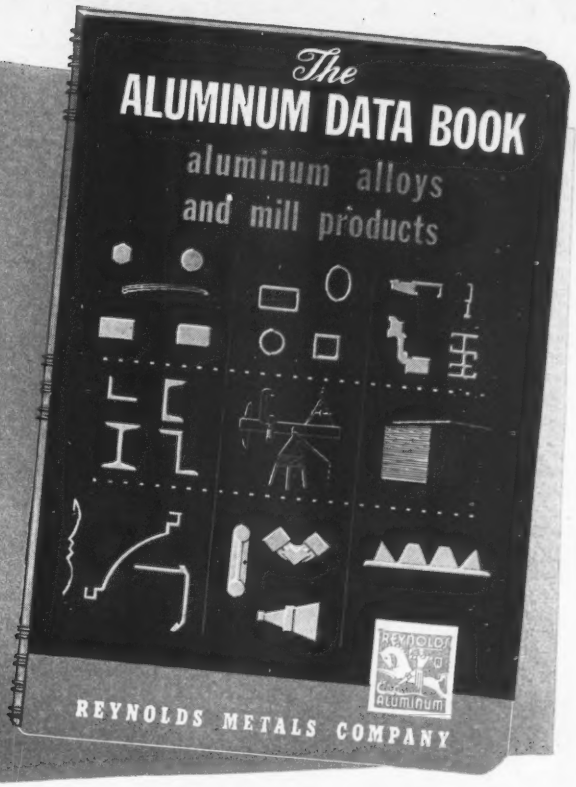
"THE ALUMINUM DATA BOOK"

All you need to know about aluminum alloys and mill products



*One in a Series of Aluminum Design and Fabricating Books

Aluminum is no longer a single metal but a large family of metals. To make an intelligent selection, the user must have definite information on alloys, tempers, characteristics, and especially mechanical properties.

The 194 page, illustrated Aluminum Data Book attempts to supply that information. Of special interest to aluminum fabricators are the sections on working wrought alloys, foundry practice and the tables on standard mill tolerances, fabricating, bending, joining and finishing aluminum.

The chapter on Fabricating Wrought Alloys contains information on forming, blanking, drawing, stretch forming, spinning, embossing, coining, stamping and tube and shape bending. There are also brief expositions on machining, forging, joining and surface finishing.

The section on Aluminum Casting Alloys outlines foundry practice. It discusses melting equipment, gating, risering and pouring, plus methods of finishing aluminum castings.

There are 117 valuable tables including those on working characteristics of both wrought and casting alloys, sand casting shrinkage allowances for various metals and 90 and 180 degree cold bending data.

This book will prove an invaluable asset to anyone who works with aluminum and its alloys.

And if you have a *special problem*, take advantage of the trained staff of Reynolds Aluminum Specialists waiting to help you. Let them show you how to overcome difficulties and set up for fast, economical production. For prompt service call the Reynolds office or distributor listed under "Aluminum" in your classified telephone directory.

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REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

Reducing Diet for Railroad Cars

To the Executive Planning for TOMORROW...

What does a "Jeep" pulling a freight car have to do with your business? Simply this. It dramatically demonstrates that profit-eating, non-revenue-producing "dead-weight" can be substantially reduced by the proper use of aluminum.

Here's what Reynolds Aluminum worked out for the railroads. In 1945, 30 Reynolds-designed and Association of American Railroads-approved, aluminum box cars were put into service. The lightest of these cars was 9,000 pounds less than the 46,000 pound average of the standard 50 ton box car. This weight reduction eliminates 72,000 ton-miles of "dead-weight" per car per year. Such savings call for progressive thinking and positive action on the part of the railroads.

Consider further, that there are savings in maintenance and in car life by using aluminum. The life of an aluminum freight car is conservatively estimated at 25-35 years before major overhaul as opposed to 10-20 for the excessively heavy, rustable metal cars ... more good reasons for using aluminum.

No matter what your business, you can profit by using aluminum for your products. It is strong but light. It is resistant to rust and corrosion ... has natural attractiveness and ease of fabrication.

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The expanding aluminum producing facilities of Reynolds Aluminum ... the ample bauxite ore deposits ... assure an increasing supply of tomorrow's main metal—at consistently low prices!

Call the Reynolds office listed under "Aluminum" in your classified directory ... or, write to Reynolds Metals Company, 2510 South Third Street, Louisville 1, Kentucky.

and to the Man in Charge of TODAY'S PRODUCTION!

Do you have a defense contract that specifies aluminum? To eliminate production problems, acquaint yourself with the accepted production techniques for fabricating aluminum. Write for complete list of Reynolds technical books covering every phase of fabrication. And for *special* problems, take advantage of Reynolds trained staff of aluminum specialists.

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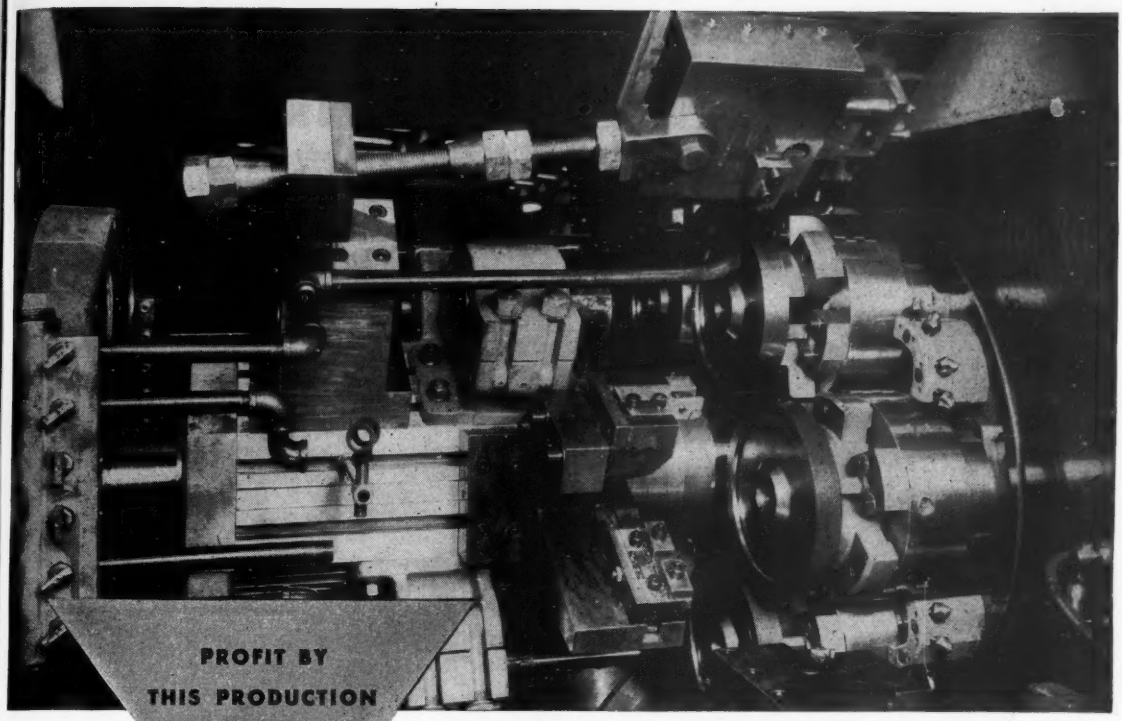
REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND



PROFIT BY THIS PRODUCTION POINTER

FIVE SIMILAR JOBS ON THE SAME MACHINE, WITH THE SAME TOOLING

The advantages of automatic production are here extended to cover a broader range of jobs because Acme-Gridley machines are inherently versatile—can be changed over with a minimum of time and money invested in tooling, and yet offer maximum high speed production.

For example, on the job illustrated, changing over to any one of the five sizes of cam shaft gear blanks machined is speeded up and simplified by the use of special tool magazines. On the 10″ six-spindle Model RPA used for this job, all facing tools are of the relieving type; the same reamers, tool bits and boring bars are used for all sizes—and machining time is only one minute thirty seconds for the 9″ size blank.

This combination of efficient tooling and rugged construction, to take the fastest speeds and heaviest feeds modern carbide-tipped tooling can stand, is a characteristic of every Acme-Gridley Automatic. May we show you how they can increase your production and cut your machining costs?

JOB FACTS

PARTS —5 Sizes of Cam Shaft Gears (9″ x 1⅝″ size illustrated)

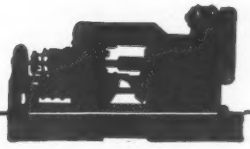
MATERIAL —Heat Treated Cast Iron

OPERATIONS—13

MACHINE —Acme-Gridley 10″—6-spindle RPA Chucker

TOOLING —Solid Carbide Inserts

MACHINING TIME—1 Minute-30 Seconds (for size illustrated)



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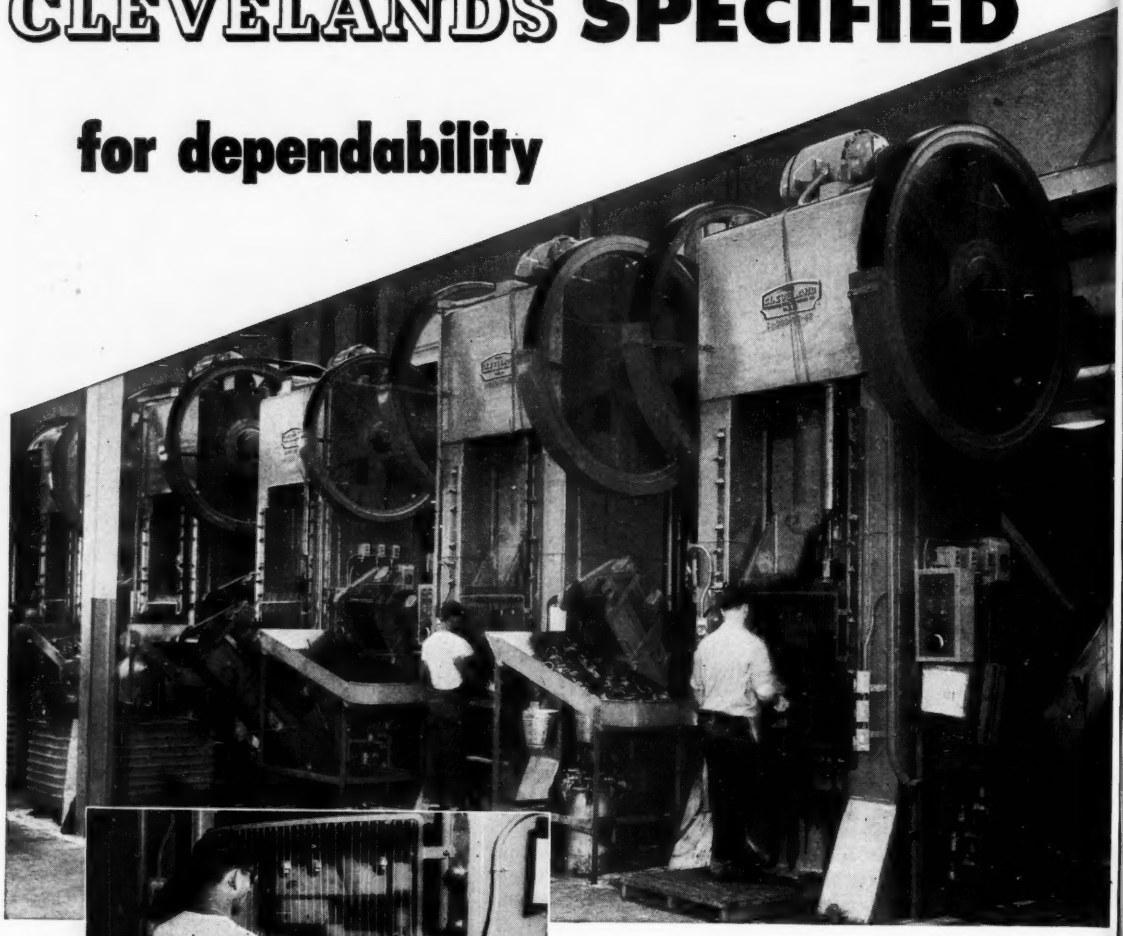

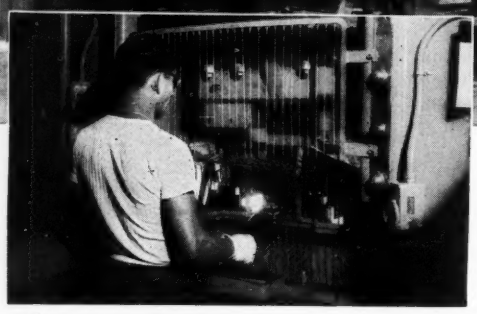

A leading automotive plant recently installed this battery of Cleveland straight sided single crank presses as their answer to the need for more economical, dependable, high speed production.

Note the automatic conveyor systems employed.

The failure of one single machine would necessarily tie up the whole production line. The fact that Clevelands were specified is a tribute to their proven dependability.

Let a Cleveland sales engineer help you speed production . . . show you how the new Cleveland drum type friction clutch and brake will give you new operating economy. See how the extremely rugged construction of every Cleveland gives you trouble-free operation and longer die life. A-4697

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FABRICATING TOOLS

CLEVELAND 14, OHIO

G-E Adjustable-speed Drive Increases Ozalid Machines' Versatility, Accuracy

Reproduction machine's speed easily set for various kinds of paper, with electronic Thy-mo-trol* drive

Reproducing "short-order" copies of virtually any kind of printed matter, drawings, etc. is the function of Ozalid's new Ozamatic machine. One secret of the versatility of this and all other Ozalid machines is G-E Thy-mo-trol drive.

Speed of the machine must be matched to the type, weight, and thickness of paper being used in each copying job. The simplicity of the Thy-mo-trol drive permits the operator to make the proper speed adjustment quickly and accurately simply by turning the speed-control knob. Thus, the machine can handle a great variety of copy jobs quickly, and with little training required for the operator.

The electronic precision of Thy-mo-trol, one of G.E.'s adjustable-speed family, has helped many equipment manufacturers improve the performance of their machines by greatly increasing their versatility and accuracy. And G-E adjustable-speed drives are helping manufacturers in every field to increase production with improved quality control, saving scarce materials, cutting rejects, and making existing machinery more flexible. One or more of this versatile drive family can probably do the same for you. Best way to find out is to mail the coupon below.

ON THE OZAMATIC, Ozalid's new desk-top machine, the operator quickly and accurately selects the desired speed—from 0 to 30 feet per minute—simply by turning the speed-control knob. Electronic Thy-mo-trol drive—standard equipment on all Ozalid machines who pioneered its use on reproduction machines—does the rest.

WHICH DRIVES ARE BEST FOR YOU?

This 26-page manual will help you decide. It shows you how to go about selecting the *right* drive. The handy drive chart included is worth your detailed study. Bulletin GEA-5334. Check here.....☐

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THE ACA MOTOR—*Speed ranges to 20:1*—An adjustable-speed a-c motor. Speed range 3:1 or 4:1 continuous; for intermittent operation from 6:1 to 20:1. Bulletin GEA-4883. Check here.....☐

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THY-MO-TROL*—*Speed ranges to 100:1*—The most accurate, most versatile, and fastest acting of all G-E adjustable-speed drives. Speed ranges of 100:1 or better. Bulletin GEA-5337. Check here.....☐

ELECTRONIC SPEED VARIATOR—An electronically controlled version of the Speed Variator that offers most of the features of Thy-mo-trol for applications in the 15 to 60-hp range at moderate cost. Bulletin GEA-5336. Check here.....☐

** Thy-mo-trol is the General Electric Company's registered trademark for its electronic motor-control system.*

Headquarters for ELECTRICAL ADJUSTABLE-SPEED DRIVES

GENERAL ELECTRIC

The most economical mover of metals available

DINGS NEW LIFTING MAGNET
Improved these ways . . .

BIG IMPROVEMENTS LIKE: moisture-proof, shock resistant all welded construction • A finer insulating compound—vitally important because of its ability to dissipate strength-sapping heat • Four point chain suspension—another Dings exclusive—for less swinging and tipping, bigger loads and much better all around control • *Scientifically balanced magnetic circuit*—the crux of a great magnet—means all magnetic strength into the lift. Proof of this lies in the extremely low heat rise.

LITTLE IMPROVEMENTS LIKE: protector plate guards, waterproof, shatterproof, jerk resistant molded neoprene neck cable connectors, tamperproof sealed terminal box and many, many others.

THEY ALL ADD UP TO: the new Dings lifting magnet—successfully designed for lighter weight, bigger payload and longer life.

LIGHT!

IN PROPORTION TO LIFT!

MOISTURE-PROOF!

IT'S ALL WELDED

A COOL OPERATOR

LOW HEAT RISE MEANS MORE LIFT!

TROUBLE-FREE!

A DOZEN NEW FEATURES KEEP IT THAT WAY!

Get Details on Why This New Dings MOVES MORE, FASTER, AT LESS COST. Send Now for the Lifting Magnet Catalog.

DINGS MAGNETIC SEPARATOR COMPANY
4710 Electric Ave., Milwaukee 46, Wisc.

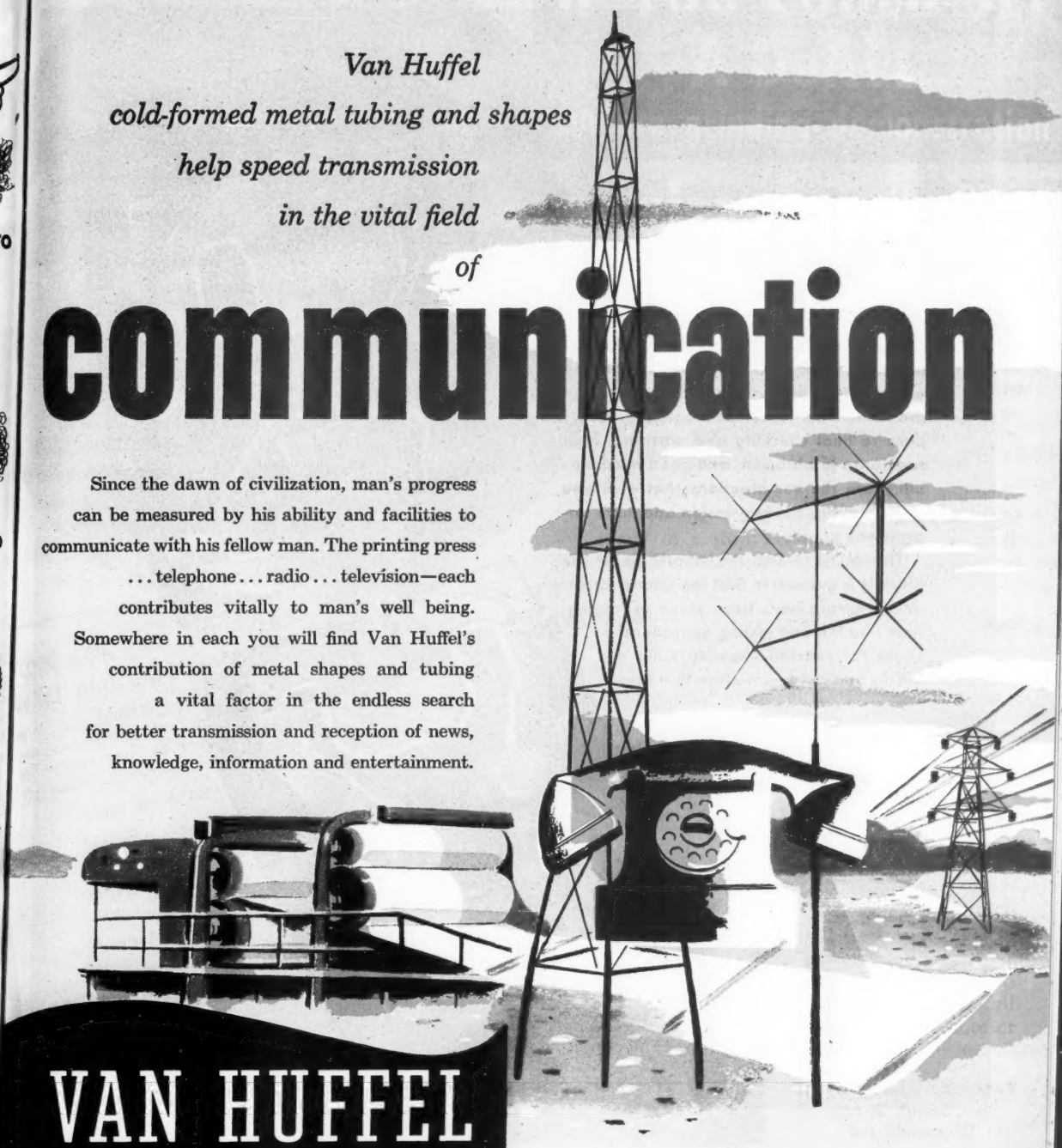
Dings Magnets

World's Largest Builder of Electric and Non-Electric Magnetic Separators for All Industry

Van Huffel
cold-formed metal tubing and shapes
help speed transmission
in the vital field
of

communication

Since the dawn of civilization, man's progress can be measured by his ability and facilities to communicate with his fellow man. The printing press ... telephone ... radio ... television—each contributes vitally to man's well being. Somewhere in each you will find Van Huffel's contribution of metal shapes and tubing a vital factor in the endless search for better transmission and reception of news, knowledge, information and entertainment.

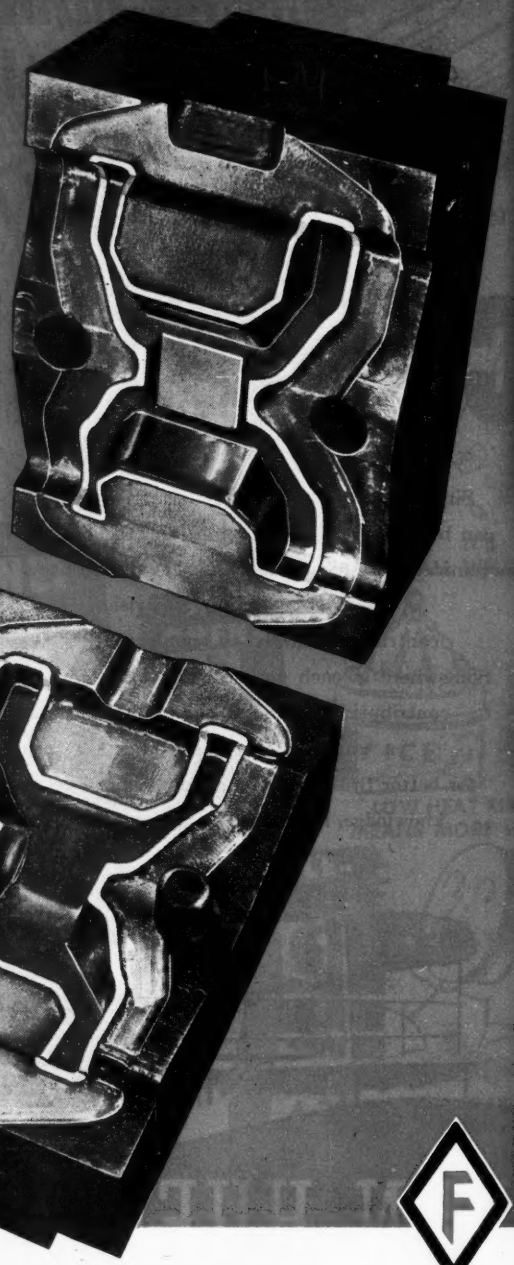


VAN HUFFEL

TUBE CORPORATION • WARREN, OHIO

WELDED, LOCK SEAM, OPEN SEAM, BUTTED TUBING, SHAPES AND MOULDINGS

"Impressions that LAST"



FINKL MO-LYB-DIE Processed Die Blocks are made from steel developed by Finkl to answer the needs arising from drop forging problems. Their inherent toughness, resistance to heat checking and washing, high resistance to abrasion, and good machinability are the combinations that give you more forgings per impression and more impressions per die.

The MO-LYB-DIE trademark on a die block is a guarantee that the utmost care and attention have been given to forging, heat treating and testing operations. Learn for yourself—specify Finkl die blocks and get impressions that last.

A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14

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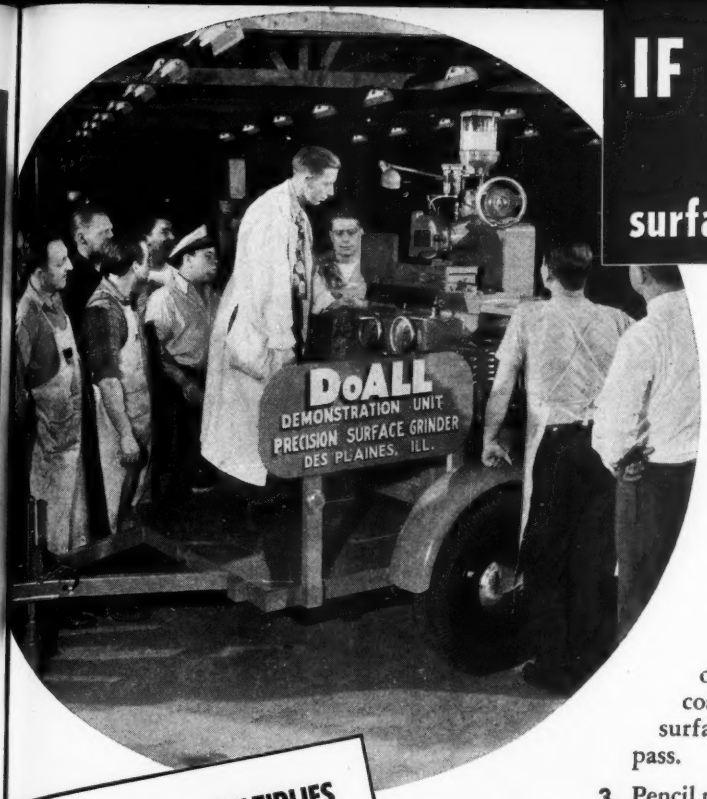
INDUSTRIAL STEEL, INC.
250 Bent Street, Cambridge 41, Mass.

Western Warehouse
FINKL STEEL PRODS. OF CALIF.
4908 Santa Monica Blvd., Los Angeles 27, Calif.

Detroit, Michigan ★ Cleveland, Ohio ★ Pittsburgh, Penna. ★ Louisville, Ky. ★ St. Paul, Minn. ★ Houston, Texas ★ Birmingham, Ala. ★ San Francisco, Calif.

IF YOU COULD SEE A DoALL
surface grinding demonstration



YOU would witness DoALL precision surface grinders do *any* surface grinding job better, faster. You could run this test:

1. Take a .020" cut in a piece of hardened tool steel. Halfway across the work reverse the crossfeed and you'll find NO "sparkout." Work is ground flat in one operation. The machine is so rigid you can take a heavy cut without fear of spindle "give" or "spring."

2. Stop the work under the wheel and without raising wheel stop the motor. The wheel coasts to a stop without touching the work surface. It took all the metal intended in one clean pass.

3. Pencil mark the work surface. By lowering the wheel .0001" only the pencil marks are removed. DoALL grinders are rigid but when you adjust the vertical column support the machine obeys—no "hang up."

"COOL GRINDING" MULTIPLIES DoALL GRINDING EFFICIENCY

With the DoALL "Cool Grinding" attachment,* coolant flows through the wheel and out in a fine mist at the point of work. This gives:

1. Faster stock removal.
2. Accurate dimensional control.
3. Freedom from cracks or burns.
4. Longer wheel life.

You can do precision grinding faster and better with DoALL "Cool Grinding." No special wheels, tanks or pumps needed. Ask about it!

*Pat. No. (2470350)

YOU can have this demonstration FREE in your own plant, at your convenience. See for yourself how DoALL rigid precision hydraulic surface grinding can help you. Ask for FREE DEMONSTRATION. Call your DoALL Store or write:

The DoALL Company
254 N. Laurel Ave.
Des Plaines, Ill.

SEND FOR BULLETIN

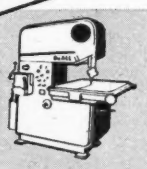
33 SALES-SERVICE STORES

DoALL®

INDUSTRY'S NEW TOOLS

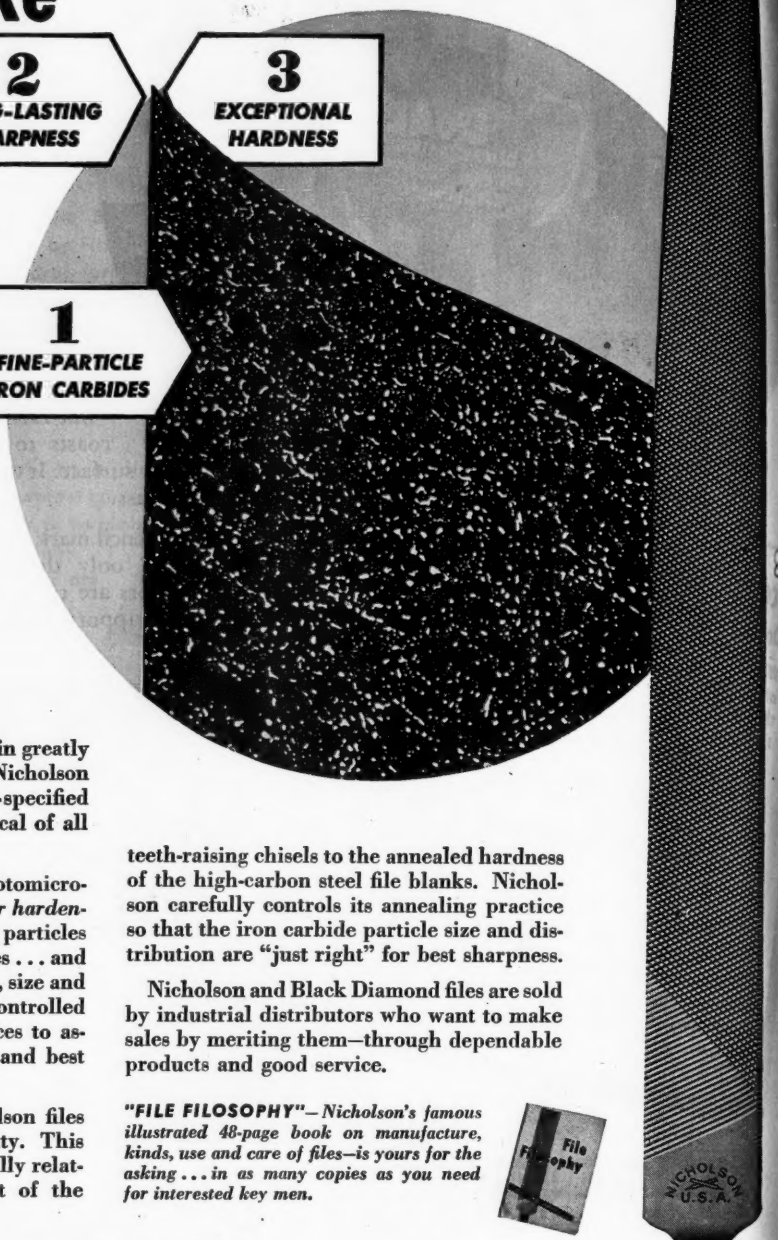
CALL DoALL FOR:

GR4



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

Three big quality points make great file-teeth points



THE pointed shape you see here in greatly exaggerated size is that of a typical Nicholson file tooth made from Nicholson-specified high-carbon steel – the most practical of all materials for files.

The mottled area is part of a photomicrographed cross section of the file *after hardening*. Note the myriad of fine white particles – technically known as iron carbides . . . and of extreme hardness. Their quantity, size and uniform distribution are carefully controlled in Nicholson's metallurgical practices to assure maximum hardness (C66-67) and best wearing properties.

The extreme sharpness of Nicholson files accounts for their fast cutting ability. This sharpness is controlled by scientifically relating the cutting angles and impact of the teeth-raising chisels to the annealed hardness of the high-carbon steel file blanks. Nicholson carefully controls its annealing practice so that the iron carbide particle size and distribution are "just right" for best sharpness.

Nicholson and Black Diamond files are sold by industrial distributors who want to make sales by meriting them—through dependable products and good service.

***"FILE FILOSOPHY"**—Nicholson's famous illustrated 48-page book on manufacture, kinds, use and care of files—is yours for the asking . . . in as many copies as you need for interested key men.*

NICHOLSON FILE CO., 71 ACORN ST., PROVIDENCE 1, R. I.
(In Canada, Port Hope, Ont.)

NICHOLSON FILES *FOR EVERY PURPOSE*

LEWIS

... has careful, organized technical control of every step in the production of ...

ROLLS

OVER 90 YEARS LEWIS OF ROLL MAKING

THE MARK OF A PERFECT ROLL BUILT TO FIT YOUR NEEDS

"X" AND "XA"
PLAIN CHILLED IRON
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SUPERIOR "X"
ATLAS AND ATLAS "B"
SPECIAL PROCESS
AJAX DUPLEX
CLIMAX AND AJAX
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MANUFACTURERS OF
ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
NON-FERROUS
INDUSTRIES

FOUNDRY & MACHINE
ION OF BLAW-KNOX CO.
PITTSBURGH, PENNA.

IN 1951

...as in 1850

THE AMERICAN CHRISTMAS
is true to tradition

And in 1951, as it has for over a hundred years, this company remains true to its tradition of exploration, development, production, transportation and distribution of the iron ores so essential to the maintenance of the American way of life.

LAKE SUPERIOR IRON ORE • FERRO ALLOYS
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THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

"Because it's so Reliable"

You'll hear this over and over again from hoist-wise men. It's the reason why they insist upon P&H Hevi-Lifts for the vital jobs in production. The P&H is always ready at the press of a button to lift and transport loads up to 15 tons — with 5-step variable speed control if you want it. This year-after-year reliability means real economy in better handling — longer life.

You pay nothing extra for these P&H ADDED VALUES

SAFER — *True motor ratings* protect you against failure at full capacity loads and speeds. P&H builds the motors with current control of only 110 volts at push button and thermal overload protection.

LIFETIME CONSTRUCTION — Precision-built — shaved gears — grease-sealed bearings — moisture, dust and acid-proof.

HANDLE IT

"thru-the-air"

AT LOWER COST.

Here's a good way to get time-saving ideas. Write for your copy of Bulletin H5-1.

P&H

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Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

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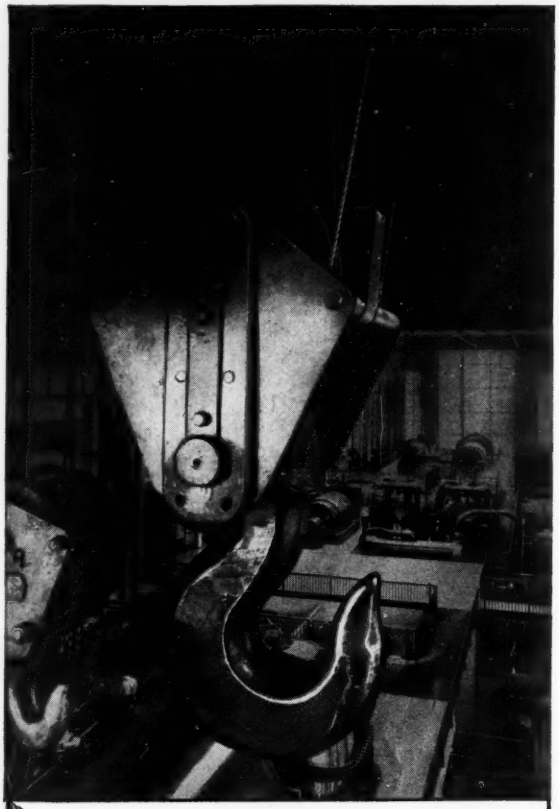
...LOADERS • OVERHEAD CRANES • HOISTS • ARC WELDERS & ELECTRODES • SOIL STABILIZERS • CRAWLER & TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

WIRE ROPE



ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices . . . have the full strength of the rope. Send for the full story.

You'll get more efficient, economical service with ROEBLING rope

TIME AND DOLLAR SAVINGS are more important than ever in industrial operations. One sure way to save time and cut costs is to specify Roebling Preformed "Blue Center" Steel Wire Rope. Here's a tough rope that stands up under shocks, acceleration stresses, excessive abrasion and bending. Its preforming assures maximum handling ease, better spooling and smooth performance.

Roebling makes a complete line of wire rope. Have your Roebling Field Man recommend the *right* ropes for your requirements. And for longest life on the job, get his advice on the correct use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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DoALL BAND TOOLS

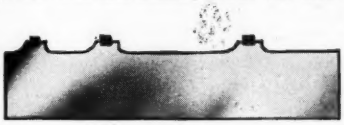
FOR EVERY JOB — ANY MATERIAL IMMEDIATE DELIVERY FROM LOCAL STOCK

CHOOSE from the world's most complete line of precision made, longer-lived band tools for every job: precision sawing, filing, grinding, polishing, honing, friction sawing and cutting of all types of ferrous and non-ferrous metals, plastics, rubber, leather, paper and other non-metallics.

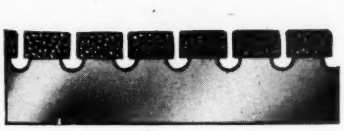
DoALL band tools are packaged in the exclusive DoALL "strip out" container for safety, convenience and blade protection. They are available in a wide selection of lengths, widths and pitch to handle any job, any material. Remember any band sawing machine performs at greater efficiency with DoALL saw bands.

Call your local DoALL Sales-Service Store today and get immediate delivery on any type DoALL Band Tool. ASK FOR BULLETINS.

Special DoALL Band Tools for the DoALL MP-20 Contour-Matic:

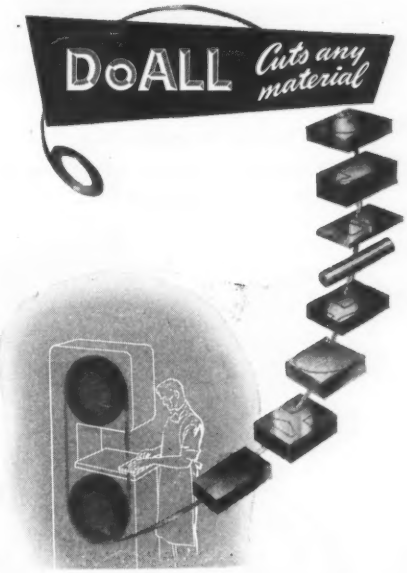


DIAMOND TOOTH BAND for sawing refractory, ceramic, vitrified, vitreous and geological materials. Diamond chips are set to stay longer.



LINE GRINDING BAND for "vertical grinding." Special band impregnated with tough, longer wearing abrasive stones. Ideal for die work.

THE DoALL COMPANY • 254 N. Laurel Ave. • Des Plaines, Ill.



SB-4

INDUSTRY'S NEW TOOLS **DoALL** 33 SALES-SERVICE STORES

Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

CLARK EDGEWOUND RESISTORS

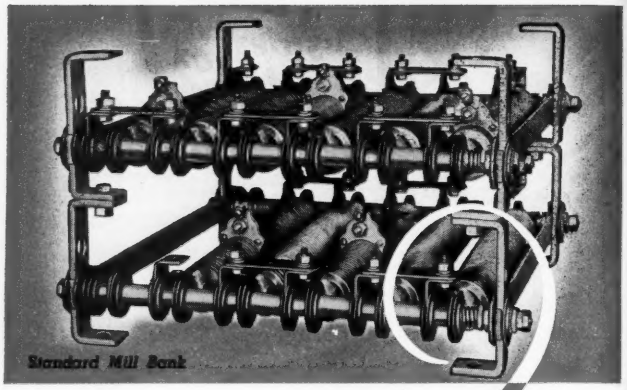
are built to withstand... VIBRATION

and individually engineered for every type of STEEL MILL APPLICATION

Thousands of CLARK Edgewound Resistors are giving trouble-free service in steel mill applications where vibration is excessive. They are especially recommended for use on Cranes, Ore Bridges, Car Unloaders, Open-Hearth Chargers and similar equipment. Clark Resistors are individually engineered to meet the demands of today's high-speed production machinery.

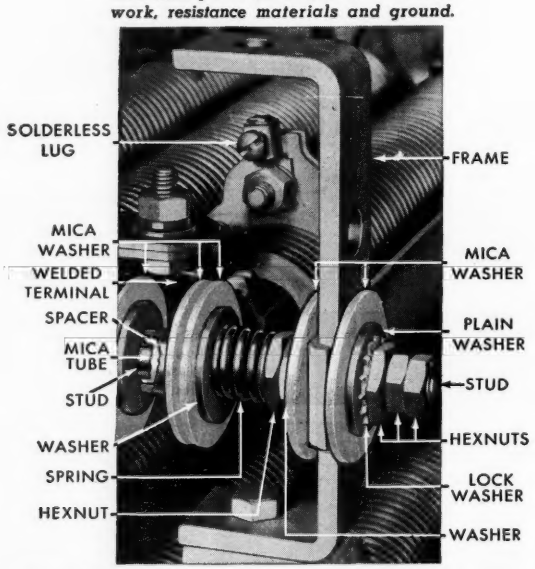
Note the many FEATURES engineered into all CLARK Bulletin 110 Edgewound Resistors—

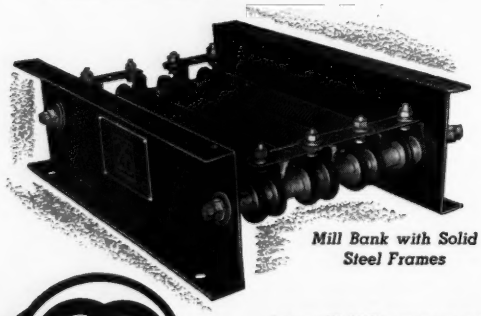
- Nonbreakable construction
- Shock resisting
- Light in weight
- Occupy small space
- Welded end terminals
- Individual units replaceable without bank disassembly
- Corrosive resistant material
- Negligible temperature coefficient
- Double insulation to ground
- Effective heat dissipation
- Flexible in application
- Current path not dependent on tightness of bank assembly



Standard Mill Bank

Detail showing double insulation to ground. Insulation points (in red) between framework, resistance materials and ground.



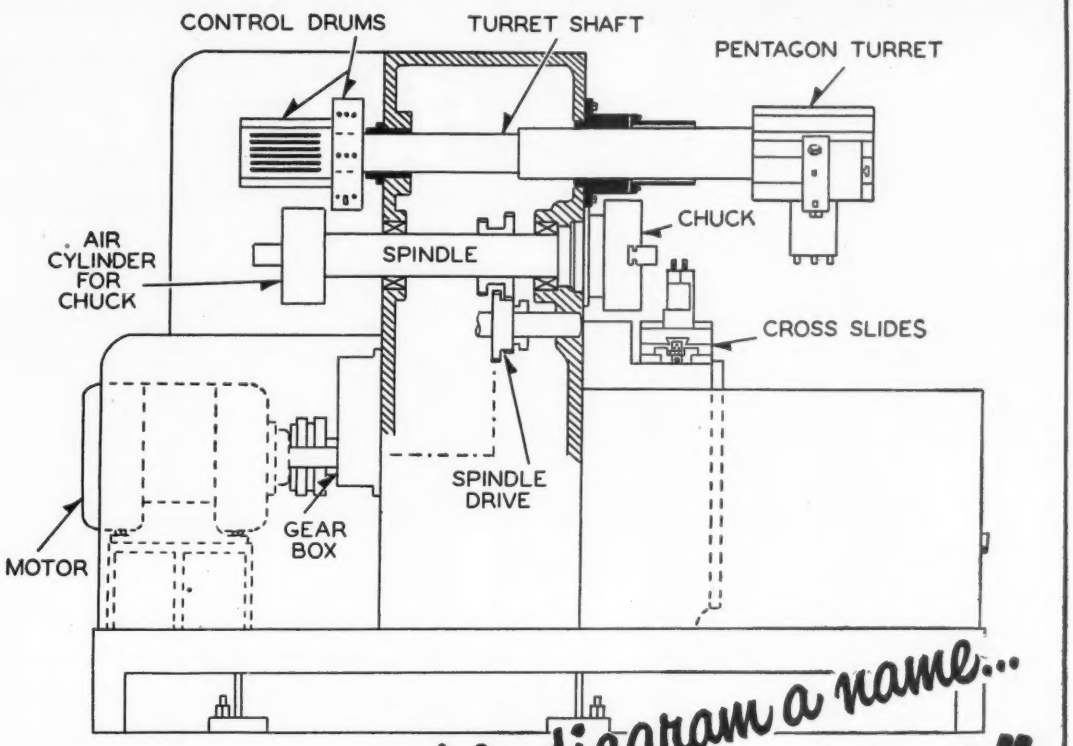


Mill Bank with Solid Steel Frames

Let a CLARK engineer tell you more about Bulletin 110 Edgewound Resistors

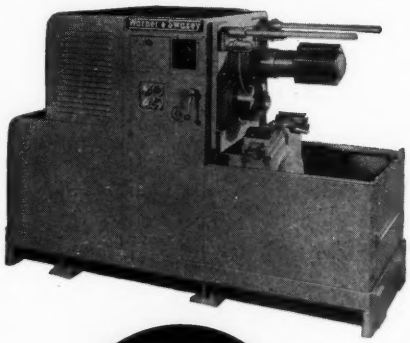
THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL · 1142 EAST 152ND STREET, CLEVELAND 10, OHIO



We've given this diagram a name...

"SIMPLICITY!"



WARNER & SWASEY
Cleveland

WE'VE LABELED IT "simplicity" because the machine it represents *is* so simple. Engineered simplicity is designed into the Warner & Swasey 1-AC Single Spindle Automatic Chucking Machine.

The 1-AC is simple and easy to set up . . . simple to tool, and simple to operate. There are no cams to change, and tooling stations are easy to get at. A wide range of speeds and feeds are readily available.

You get accurate, automatic machine operation on even small lot jobs that were never practical for automatic machines before.

One man can operate two machines, turning out substantially more production than two men on hand operated machines . . . and with a large saving in setup time.

Certain machining jobs in your plant—even in small or medium lot runs—can undoubtedly be done faster, and with less manpower, with the 1-AC Automatic. To find out how this 1-AC fits into your production picture, call our Field Representative in your territory.

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

Udylite
SELENIUM RECTIFIERS
last longer—
WORK BETTER AT LOWER COST

These new Udylite Selenium Rectifiers are built for top performance at high current densities. They're designed and engineered to give long, efficient service under tough usage. Actual factory-supervised tests prove this fact! A number of selenium stacks were operated continuously for 10,000 hours at the ambient temperature of 35° C at rated loads. Voltage output at the end of this grueling test was *98%* of initial value. In addition, Udylite Selenium Rectifiers offer all of these other outstanding features:

- **Compact, to save space and weight.**
- **Approximately 6,000 sq. in. of rectifying area.**
- **Wide range in combinations of standard sizes.**
- **From a few amperes to thousands of amperes.**
- **Permanent characteristics.**
- **Immune to atmospheric changes.**
- **Adaptable to any type circuit or load.**
- **High efficiency per unit weight.**
- **Economical in cost and operation.**
- **Simple to install and operate.**
- **No moving parts, no maintenance costs.**

Have your nearby Udylite Technical Man give you the complete story about Udylite-Selenium Rectifiers. Or write to *The Udylite Corporation, Detroit 11, Michigan,* for literature describing these units. There's no obligation.

GEARED TO DEFENSE

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

just fine steels

all custom made

If you wish to enjoy the profitable use of the finest of quality-controlled special steels—not standard warehouse brands but tailored to your specific need—then call on Jessop.

- high speed steels
- high speed bits
- precision ground flat stock
- high speed and alloy saw steels
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- stainless and heat resisting steels
- valve steels
- stainless clad steels
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- composite tool steels
- armor plate

JESSOP

Steel Company

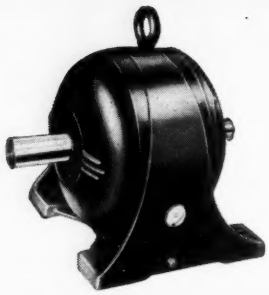
WASHINGTON, PENNSYLVANIA

FOOTE BROS. *Enclosed Gear Drives*

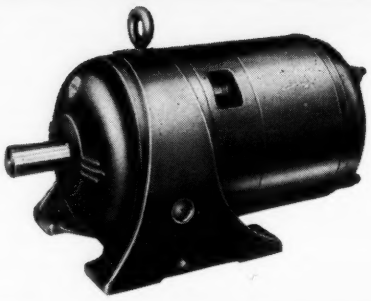
HIGHEST IN QUALITY • SUPERIOR IN PERFORMANCE

WIDE RANGE OF TYPES AND SIZES

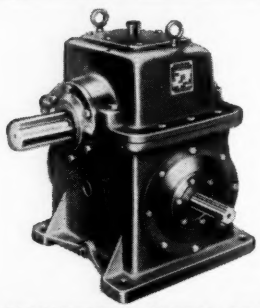
Enclosed Gear Drives—a size and type to meet every application. The latest in gear-cutting equipment backed by nearly a century of engineering and manufacturing experience. New techniques, better control of material, improved manufacturing methods—all assure superior enclosed gear drives.



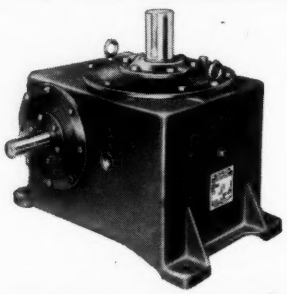
LINE-O-POWER STRAIGHT LINE DRIVES
Available for prompt delivery
High quality Duti-Rated Gears permit maximum power in minimum size. These drives are economical, both in original cost and operation. Double or triple reductions with ratios from 5 to 1 up to 238 to 1 and capacity range from 1 up to 200 h.p. Write for Bulletin LPB.



FOOTE BROS.—LOUIS ALLIS GEARMOTORS
Available for prompt delivery
Duti-Rated Gears with file hard tooth surfaces and resilient cores assure long wear life and maximum load-carrying capacity. Wide range of highest quality motors in open drip-proof, splash-proof, enclosed and explosion-proof types. Write for Bulletin GMA.



HYGRADE HORIZONTAL WORM GEAR DRIVES
Available for prompt delivery
High in quality, compact in design, incorporating precision worm gearing. Available in a wide range of types to meet any need. Ratios from 4⅛ to 1 up to 4108 to 1. Capacities up to 260 h.p. Write for Bulletin HGB.



HYGRADE VERTICAL WORM GEAR DRIVES
Available for prompt delivery
Vertical output shafts extended either upward, downward, or both. Also available in Hytop design with wider low speed bearing span to accommodate vertical output shaft extensions. Ratios 4⅛ to 1 up to 4108 to 1. Capacities up to 260 h.p. Write for Bulletin HGB.

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Better Power Transmission Through Better Gears

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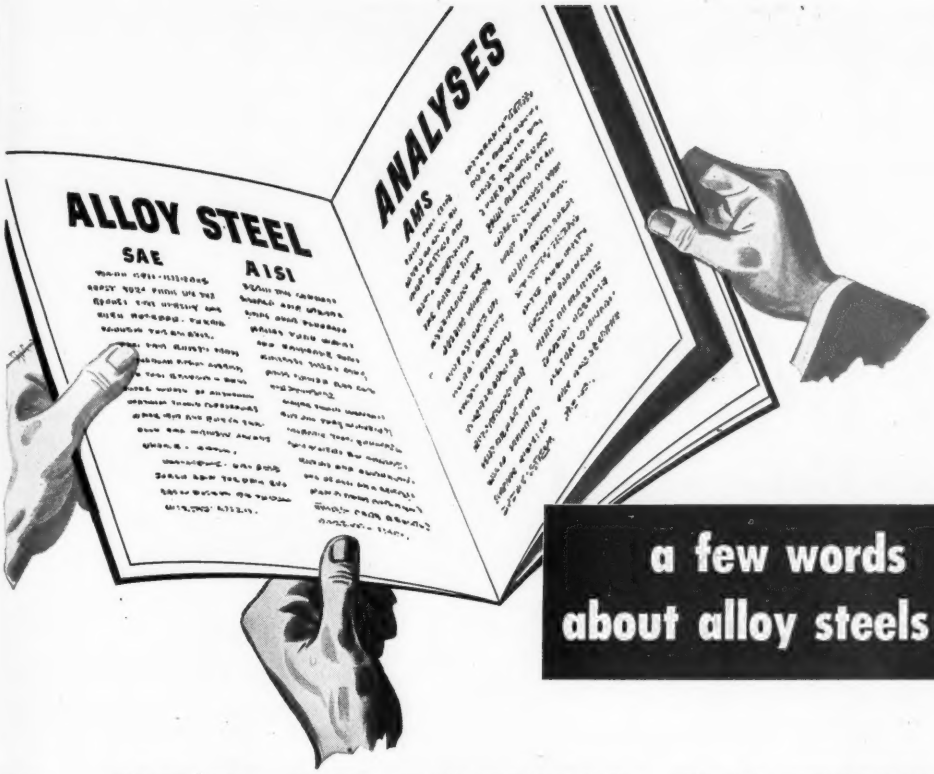

a few words about alloy steels...

OR...HOW WE MEET RESTRICTIONS WITH EXPERIENCE

● When you face government restrictions on any of the alloy steels you have been using, it's time to draw on the all-inclusive experience of the Republic 3-Dimension Metallurgical Service.

You and your own metallurgists will get expert assistance from the closely-coordinated Republic three-man team . . . the Field Metallurgist, the Laboratory Metallurgist, and the Mill Metallurgist. Their combined experience in solving problems of alloys, manufacture and steel processing is helping hundreds of alloy steel users make the most of currently available specialized steels.

In spite of the growing restrictions on many alloy steel analyses, you probably can switch your production to one of the many alloy steels being produced by Republic...world's largest producer of alloy and stainless steels.

Which one? . . . Ask a Republic Metallurgist.

REPUBLIC STEEL CORPORATION
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Republic ALLOY STEELS

REPUBLIC STEEL

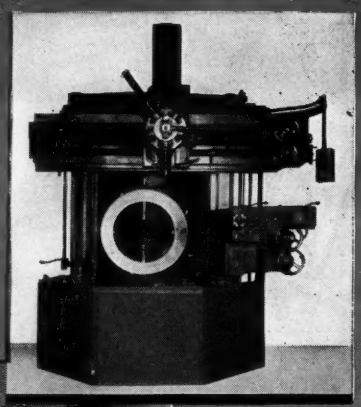
Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

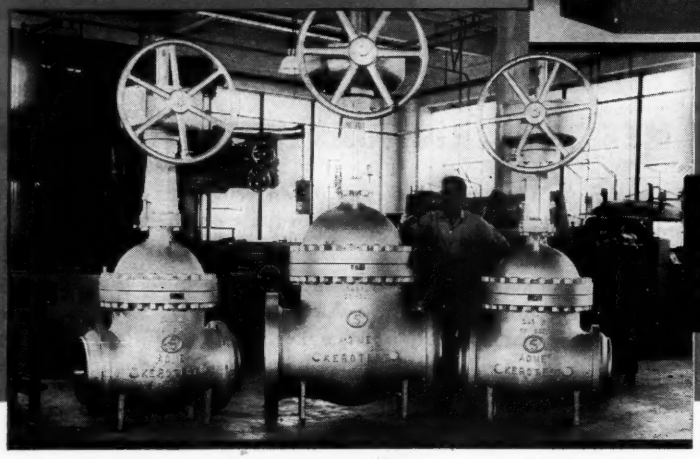
HEAVY WORK ... Odd Shapes

ON

CUTMASTER VERTICAL TURRET LATHES

Where the work is Heavy and many times odd shapes, the ruggedness and well balanced design dictates the choice of Bullard Cut Masters.





Cut Master and Heavy valve work at Guelph Engineering Co., Guelph, Ontario, Canada.

The uneven whip of odd shapes and off-center work has not in any known instance affected the accuracy and smooth cutting of these rugged machines.

Whatever your class of work may be it will pay to investigate Cut Master.

THE *Bullard* COMPANY

BRIDGEPORT 2, CONNECTICUT

What Type Preservatives Must I Use?

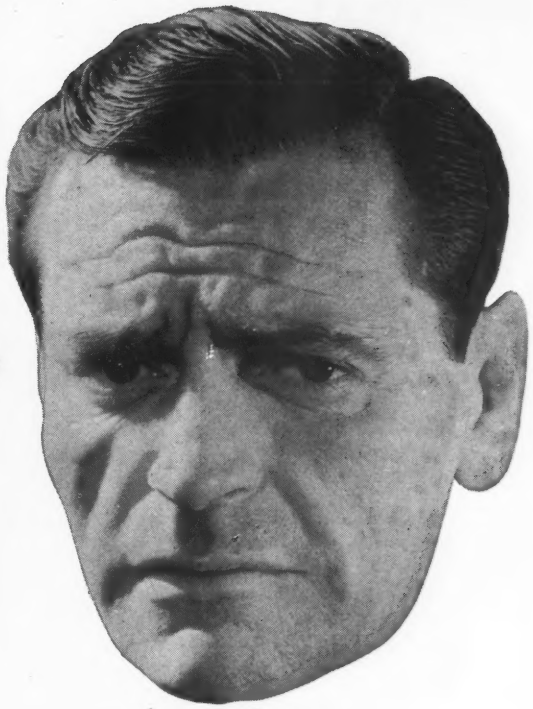
How Do I Apply Them?

How Much Do I Need?

Is a Carton Overwrap O.K. Here?

What Barrier Materials Are Necessary?

What Forms Do They Come In?



questions about packaging?

Dearborn has the materials . . . knows the methods

If you have a government contract and need assistance in packaging your products to government specifications, see your Dearborn packaging engineer.

Dearborn supplies all the government specified materials, including rust preventives, wrappers and sealers, case liners, fingerprint neutralizers. **But, more important to you, Dearborn packaging engineers will visit your plant, plan your packaging procedures to insure your products against the threat of corrosion.**

This is a service that is available to any manufacturer with a packaging problem—and particularly designed for you with government contracts for export shipment. The coupon is for your convenience.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

This booklet will help you

The new edition of "Preventing Corrosion in Export Packaging" gives you: (1) current government specifications; (2) cleaning methods; (3) approved packaging methods; (4) how to apply rust preventives; (5) how to wrap, seal and dip parts; and (6) other valuable information with step-by-step picture stories. Write for it today.

Dearborn Chemical Company, Dept. S
Merchandise Mart Plaza, Chicago 54, Ill.

☐ Please send a copy of "Preventing Corrosion."

☐ Have a Dearborn Packaging Engineer call.

Name.....

Company.....

Title.....

Address.....

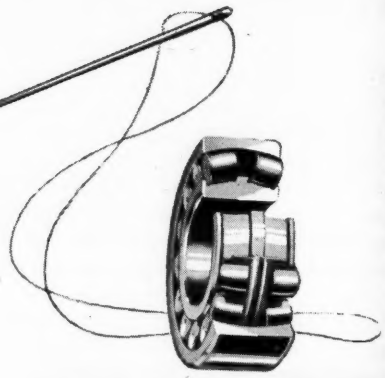
City.....*State*.....

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE

MARROW OF MODERN LIFE



From the housewife's needle to the builder's I-beam, steel is part of every phase of modern life. The mills producing it are thundering at ever higher speeds, speeds made possible by close co-operation between designers and engineers in every industry which supplies components for the strip mills, blooming mills, rolling mills which are turning out ever-mounting tonnages. For many years, SKF has worked hand-in-hand with the steel industry, and has met and often anticipated its needs for the right bearing in the right place. 7268

SKF
BALL AND ROLLER BEARINGS

8 REASONS WHY **SKF** IS PREFERRED BY ALL INDUSTRY

integrity • craftsmanship • metallurgy
tolerance control • surface finish
product uniformity • engineering service
field service

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

America needs your daily pound of scrap

IF every man, woman and child in America provided one pound of scrap each day, they would supply just about enough to produce the 105 million tons of new steel that the industry hopes to make in 1951.

Like yeast in breadmaking, scrap is essential to steelmaking. Scrap speeds up the process because scrap is already-refined steel. Every ton of scrap used replaces one ton of pig iron. Thus scrap also saves raw materials, because each ton of pig iron represents two tons of iron ore, one ton of coal and half a ton of limestone.

The continuing co-operation of every reader of this page is urgently requested to overcome a scrap shortage daily growing more critical. Turn in--by selling your scrap to regular scrap-gathering channels--any and all broken, worn-out or obsolete things made of iron and steel--machines, tools, pipe, boilers, structural parts and other "junk" you'll probably never use again.

Do your part in the campaign to help meet America's need for more steel. Enlist now for the duration. Remember that the scrap you furnish may help you get more steel.

YOUR SCRAP YOUNGSTOWN IS NEEDED

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

ATKINS
"Silver Steel"
PRODUCTS
wish you
a Merry Christmas
and a Happy New Year
E. C. ATKINS AND COMPANY
Indianapolis, Indiana
Manufacturers of Saws, Files and Knives for Home, Shop and Industry

Something

in the way of

SPRING SERVICE

- **Free Publications** for the Engineer
  - "Handbook of Spring Design"
  - "The Mainspring," a periodical
  - "Handbook of Spring Steel"
- **Dependable Service** for the Purchasing Agent
- **Quality Control** in manufacture for the Inspector
- **Ten Plants** for flexibility
- **Small Orders** always welcomed

THE BEST ten SOURCES FOR MECHANICAL SPRINGS

10

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE.
CHICAGO 14,

RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA

BARNES-GIBSON-RAYMOND
40300 PLYMOUTH RD.
PLYMOUTH, MICH.

B-G-R COOK PLANT
ANN ARBOR
MICHIGAN

F. N. MANROSS AND SONS CO.
BRISTOL
CONNECTICUT

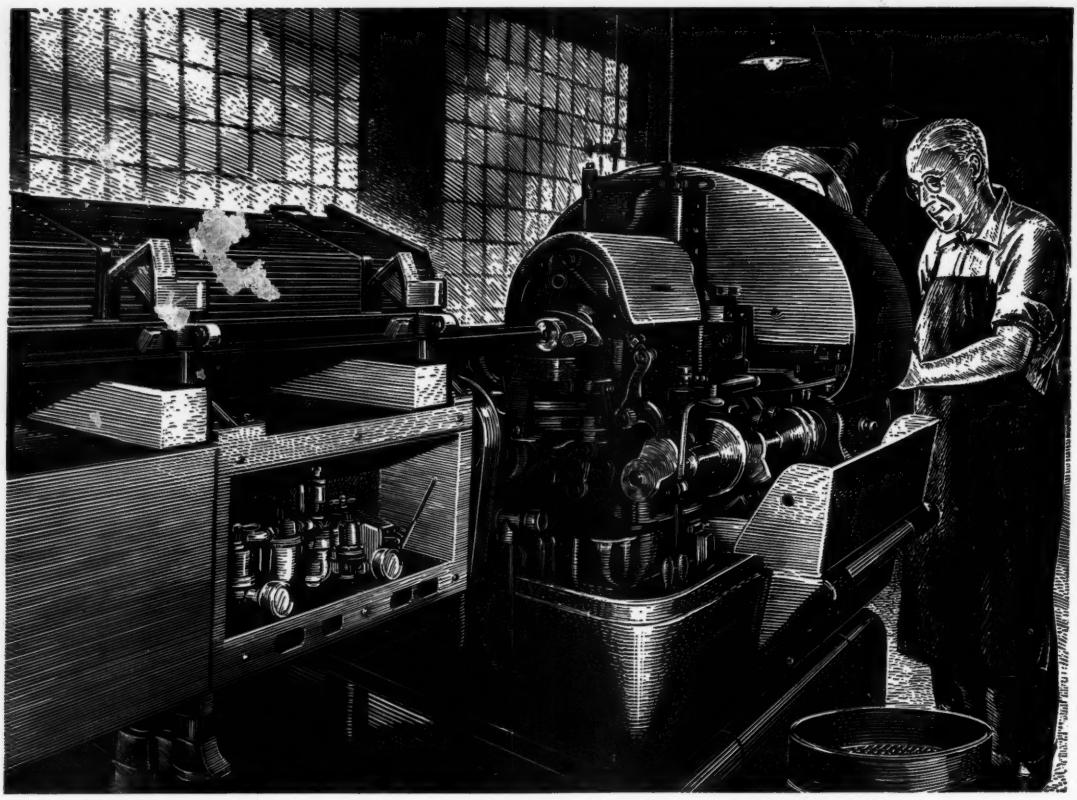
OHIO DIVISION
1712 EAST FIRST ST.
DAYTON, OHIO

DUNBAR BROTHERS COMPANY
BRISTOL, CONN.

MILWAUKEE DIVISION
341 E. ERIE ST.
MILWAUKEE, WIS.

THE WALLACE BARNES COMPANY LTD.
HAMILTON, ONT.
CANADA

DIVISIONS OF
ASSOCIATED SPRING CORPORATION
AND CANADIAN AFFILIATE



Stiffest fabricating demands met by Scovill High-Speed Brass Rod

With production demands rising and brass scarcity continuing, you need *full utilization* from every piece of free-cutting brass rod you fabricate.

That's why you need the unsurpassed *soundness* and *uniformity* of *Scovill High-Speed Brass Rod*...to assure accuracy, eliminate waste, save time and labor. Minimum tool wear when using this rod permits tolerances to be closely held on finished parts.

This rod-to-rod uniformity... in composition, in freedom from internal defects, in free-cutting temper . . . is achieved through Scovill's unique *continuous-casting* process, plus quality-controlled annealing and drawing procedures. *Scovill High-Speed Brass Rod* superiority is also due to straightness, smooth surfaces, clean chamfering, close tolerances, improved packaging.

When you *are* able to get Scovill Brass Mill Products under existing restrictions and controls, you can be sure...

"You can't buy better brass"

SCOVILL

A PRODUCT OF SCOVILL

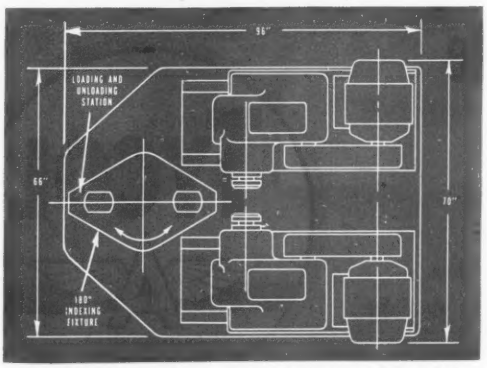
For complete information, contact: SCOVILL MANUFACTURING COMPANY, 83 MILL ST., WATERBURY 20, CONN.

BRASS MILL PRODUCTS IN A COMPREHENSIVE RANGE OF COMMERCIAL ALLOYS, SHAPES, TEMPERS AND SIZES

A New Concept- DUPLEX PRODUCTION Milling Machines as Developed by MOTCH & MERRYWEATHER

Great power and rigidity are transmitted at the tool point. Right-hand and left-hand milling heads rapid traverse approach, feed, and rapid return. The rotary index table carries two sets of workholding fixtures and is positively locked at the milling station. Here is the essence of rigidity.

M. & M. Duplex Production milling machines fit easily into conveyorized production lines. Parts are loaded and removed at one station. Production: 268 tractor side bars per hour at 100%.



Drawing above shows general design of Motch & Merryweather Duplex Production Milling Machine.

With this Motch & Merryweather single-purpose production milling machine the two heads move, not the operator. There is no milling table to move. Let us tell you why greater rigidity and power (30 h. p.) will jump your production. Fixtures can be changed within certain limitations to suit your requirements. Your part drawings will receive our prompt attention.

Manufactured by

THE MOTCH & MERRYWEATHER MACHINERY COMPANY
715 PENTON BUILDING • CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

"Tycol Afton keeps cutting edges cool... lengthens tool life between grinds"

Right! Tycol Afton Cutting Oil steps up tool performance . . . allows closer tolerances and finer finishes.

It makes fast, free cuts possible—reduces spoilage and the need for frequent regrinding.

Tycol Afton is a "dual purpose" oil, used for both cutting *AND* machine lubrication. Several grades are available for use on any specific machine tool.

For complete information, call or wire your nearest Tide Water Associated office today.

TYCOL

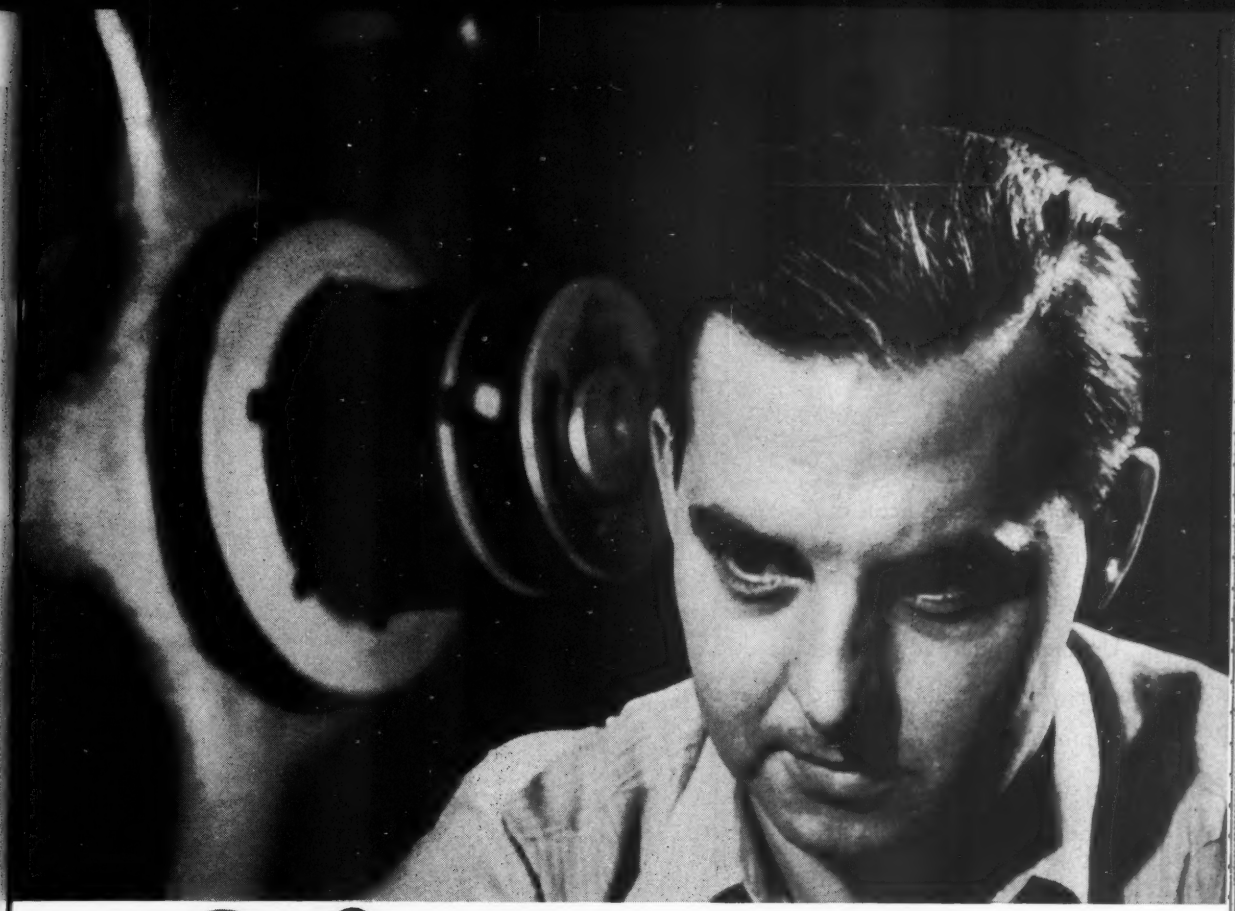
INDUSTRIAL LUBRICANTS

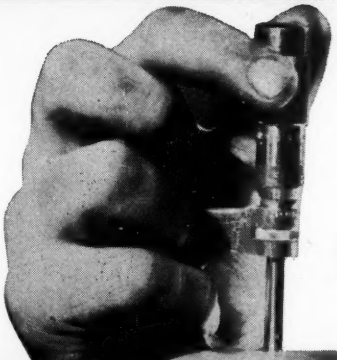
Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco

TIDE WATER ASSOCIATED OIL COMPANY

17 BATTERY PLACE · NEW YORK 4, N.Y.

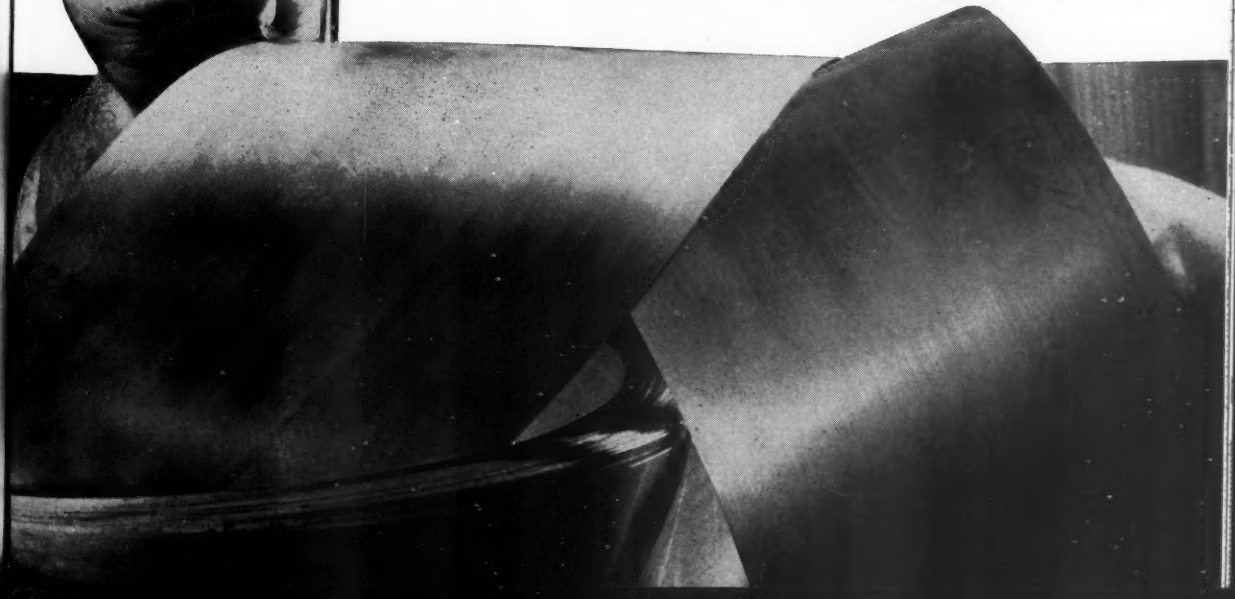
SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"





He's looking at it through *your* eyes . . . yes, he's *your man,* when he checks the dimensions of Bristol Brass sheet, rod, or wire against your original specifications. And when he says: *"On the nose"* . . . then that's *it.* There are a lot of men like this . . . in fact, *all* of them are like this . . . ready to work for you at: The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best



Some like their sleeves shorter . . . .

Starting with small heats at the Washburn Steel Mill, Washburn Wire is tailored to exact specifications.

Uniform Quality is never sacrificed to expediency—Washburn Craftsmen must make their product fit the demands of your product.

For over half a century, manufacturers have depended on WASHBURN.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold-rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Exide-Ironclad
BATTERIES

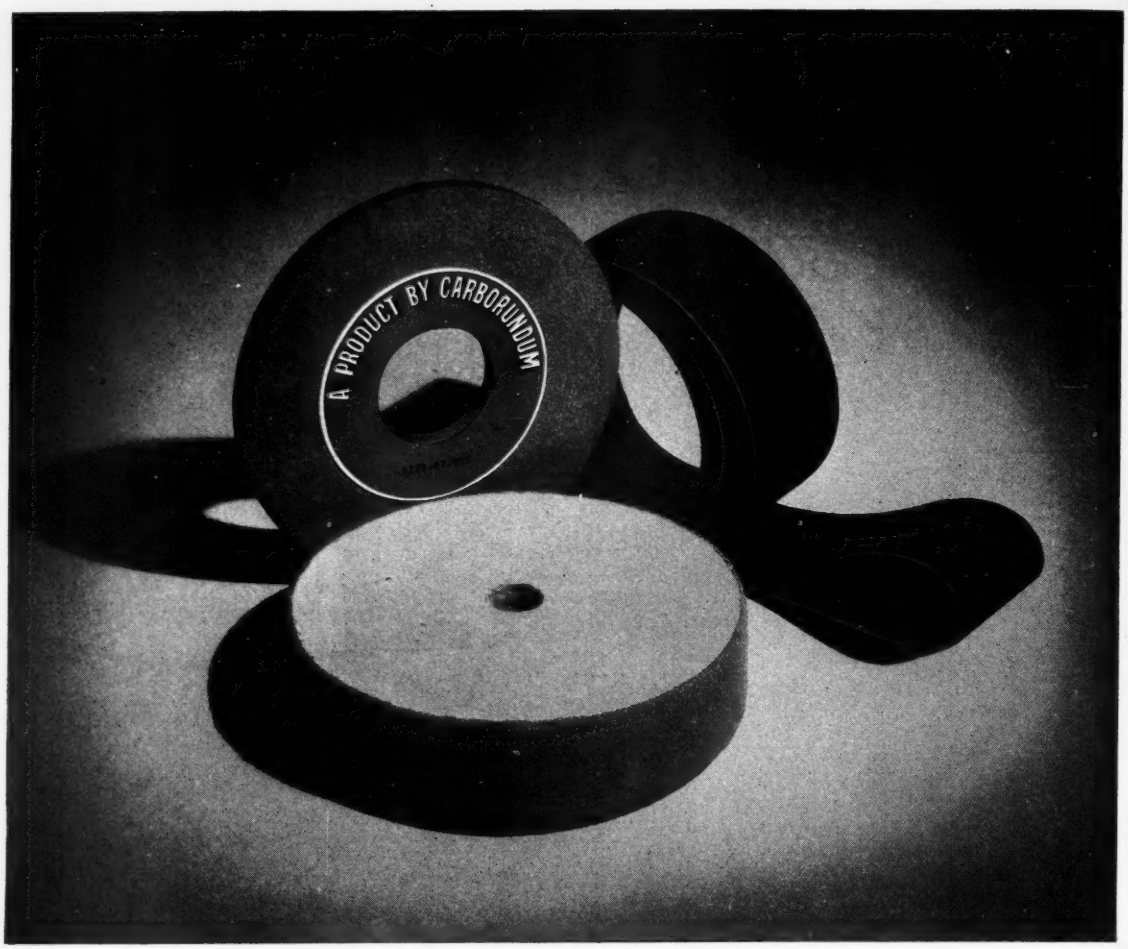
ARE YOUR BEST POWER BUY— AT ANY PRICE

They ASSURE high maneuverability of trucks . . . rapid, accurate handling of material. PROVIDE uniform rate of material handling with no unscheduled down time. SHOW lowest costs of operation, maintenance, repair, depreciation . . . inherently safe. Call in an Exide representative, and let him prove these facts.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*



You can't miss...

Not when you pick a product by CARBORUNDUM. A complete line of all abrasive products is your assurance of selective product application. You match the best method with the right product from the complete standard line by CARBORUNDUM.

Thus, the recommendation of an experienced CARBORUNDUM salesman or distributor is not merely helpful...it's impartial. These men have no reason to offer anything but the best method and product for your job...they sell the only complete line of products identified by the best known name in abrasives.

This experience in all abrasive products and methods is an excellent proving ground for new products and methods. Ask your CARBORUNDUM representative about them. You can't miss.

Only CARBORUNDUM

TRADE MARK

makes ALL Abrasive Products... to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N.Y.

GET IN THAT IRON AND STEEL SCRAP!

An Emergency

FACES AMERICA'S STEEL INDUSTRY!

America's steel industry must have more scrap *immediately* if it is to meet defense production needs. The shortage of scrap is now the worst it has been since the days of Pearl Harbor. Steel production is bound to slow up unless scrap supply improves!

The odds and ends of scrap in your plant may not seem to amount to much. But it may be more than you think, and even small amounts are important. Added together, the scrap from industrial plants throughout the country will make hundreds of thousands of tons of vital steel.

Look around your plant, warehouses and yards for all the scrap you can find. Worn out machines, tools, pipe, boilers, structural parts—anything of iron or steel that can be spared. Sell them to your scrap dealer *now*. Every bit will help to meet this emergency.

Scrap Metal Market Conditions Described As Wholly Unsatisfactory
Mill Stocks Of Scrap Generally At Critical Low
Steel Warehouse Trade Participating In Collection Drive
PITTSBURGH —The steel
Steel Scrap Supply Continues Tight On The Pacific Coast
SAN FRANCISCO. — The steel scrap supply continues tight in the Bay Area, and is
SCRAP DRIVE HERE TO BE STEPPED UP
Commerce Department Office to Scout Auto Graveyards to Supply Steel Mills
Scrap Supply Seen As Most Critical Problem
Industry Men Meeting
WASHINGTON — Construction
Steel Producers Seek More Scrap From Industrial Consumers
NEW YORK —Nati
Demand on Steel Continues Stron
STEEL INVENTORIES REACH A MINIMUM
Deliveries to Warehouses Are Expected to Drop by 23% During Fourth Qu

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Weirton chose Monel...

Monel scrubber section of new Weirton No. 4 Electrolytic Tin-Plating Line. Monel was chosen because of its high resistance to hot pickling acids. Photos courtesy of the Weirton Steel Co., Weirton, W. Va.

Scrubber tanks of Monel help keep maintenance costs low in Weirton Steel Company's new electrolytic tin-plating line

Capable of a continuous coating speed of 2500 feet per minute, the Weirton Steel Company's new No. 4 Electrolytic Tin-Plating Line is said to be the largest and fastest in industry.

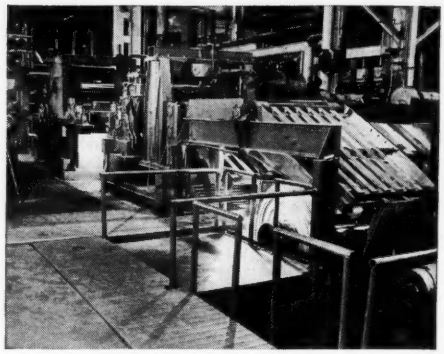
The rated capacity of the new line is 5,000,000 base boxes per year, raising the Weirton Tin Mill production potential to 15,000,000 base boxes annually.

Pickling tanks in the line are 100 feet long... oversize because of the high speed of the strip passing through. The scrubber section, where the steel sheet is washed with hot water to remove carried-over pickling acid, is made of Monel®. Monel was chosen for this application because of its excellent resistance to hot pickling acids... an essential quality for low maintenance costs.

Equipment for the new line was manufactured by the Wean Engineering Company of Warren, Ohio, and the Westinghouse Electric Corporation of Pittsburgh, Pennsylvania. The line was designed by the Weirton Steel Company's own engineering department.

If you – like the Weirton Steel Company – have metal problems involving corrosion or high temperatures, remember that INCO's Technical Service Department is always ready to help you solve them.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.



End of Weirton high-speed electrolytic tin-plating line, showing finished tin plate being coiled. The line is the largest and fastest of its kind, making the Weirton, West Virginia, plant the world's largest tin mill.

* * *

Although Nickel and Nickel Alloys are being diverted to defense, INCO advertisements will continue to bring you news of products, applications, and technical developments.

* * *

MONEL EMBLEM OF SERVICE INCO TRADE MARK **...FOR MINIMUM MAINTENANCE**

December 17, 1951

Between the Lines

You can interpret the reports that government people think the steel industry can raise wages as much as 40 cents an hour without needing price relief as a build-up on the part of a labor-loving administration to justify a wage increase for the steelworkers. And—equally significant—the reports put the steel companies on the defensive in negotiations.

Subsidies Next?

The cost is rising in the administrative expense of running the price controls system. The U.S. Chamber of Commerce estimates that World War II price controls cost more than $5.7 billion. We haven't yet reached that now, but we may come close. The big cost in World War II was subsidies. Except for the regular farm parity setup, that hasn't been resorted to thus far. Subsidies may eventually be tried by Washington stabilizers if they can't—or won't—stop labor increases.

Preparedness Program

Business looks good; business looks bad. There are almost as many opinions on economic prospects as there are analysts. But you can't go too far wrong if you avoid heavy debt, take a breather on plant expansion, re-examine your business in the light of the tax impact, be careful not to overcommit yourself on social benefits and take periodic resurveys of your position all next year, particularly next July or August. That's the advice of Henry H. Heimann, executive vice president of the National Association of Credit Men.

From Brass to Aluminum

General Electric Co. has not been saying much about its gradual switch from brass to aluminum bases for its electric light bulbs. One reason has been that NPA approval was long pending on higher aluminum allotments. The changeover was dictated by a number of reasons, but one was the brass shortage. Copper producers, incidentally, are getting more and more annoyed about repeated warnings from Washington that copper and brass will be short for a long time. They admit the problem's serious, but they think it has been over-publicized.

Indirect Help

The use of job evaluation programs for managerial positions is increasing, partly because of the salary stabilization schemes under the Defense Production Act of 1950. If a company has a formal job evaluation program, the salary board is more apt to grant increases. Job evaluation is being found an increasingly important tool for top

Production-Engineering News—p. 89 *The Market Outlook—p. 147*

executives, especially in larger firms, to determine the range and extent of pay raises. National Industrial Conference Board says 55 per cent of 244 firms just surveyed have managerial evaluation programs, compared with only 33 per cent when a similar check was made in 1946.

In Case of Fire

Fire losses are expected to reach $735 million in 1951, an alltime high. A large share of that loss can be traced to the failure of business and industry to take adequate fire precautions. In hectic production times like these, fire losses always mount. The upward trend may continue in 1952. Are you prepared?

No Bluff on the Seaway

Canada isn't bluffing when she says she'll build a St. Lawrence Seaway whether the U.S. participates or not. The project is vital for her trade, and it is likely to prove vital for ours. A seaway would be especially important to U.S. industry when we come to rely more heavily on Labrador and overseas ores. The possibility for action soon by the U.S. on the project is remote.

New Look

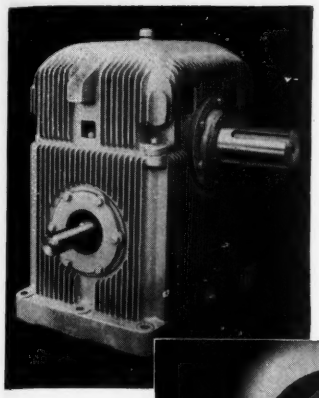
Watch for a more positive approach on economic matters by National Association of Manufacturers. Its new president, William J. Grede, president of Grede Foundries Inc. in Milwaukee, runs a progressive company and wants a more influential NAM. The association will attempt to throw off its reputation of staid conservatism.

Straws in the Wind

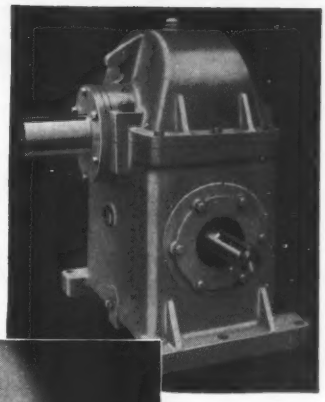
Government-held surplus stocks of aluminum, copper, lead and zinc scrap will be made available to industry instead of being transferred to the strategic stockpile . . . The Steel Products Industry Advisory Committee is against a proposed government plan to buy conversion steel; it suggests that consumers be permitted to obtain the material without charging such purchases against allotments . . . DPA Boss Manly Fleischmann predicts that second quarter metal allotments for consumer durables will be cut sharply from first quarter levels.

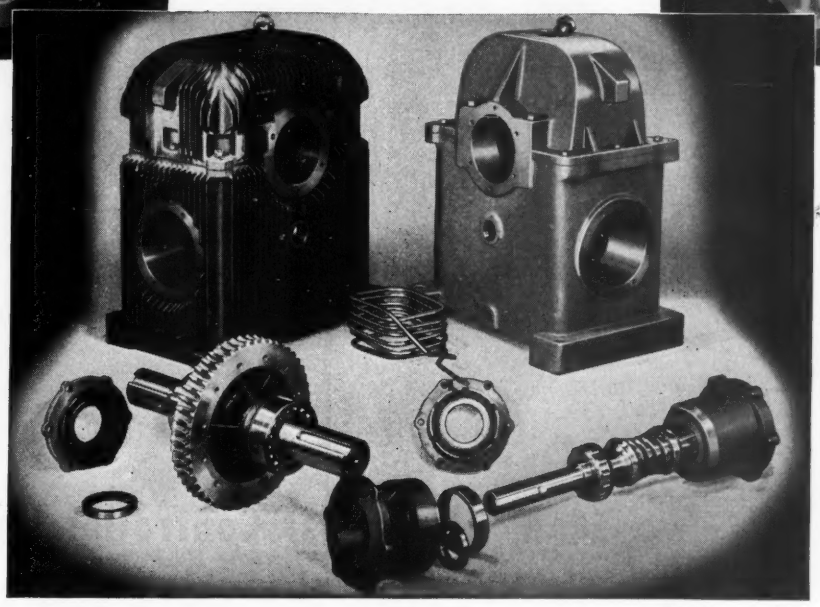
Here and There in Industry

The Capehart Amendment may not give as much pricing help as first thought (p. 61) . . . Kaiser has opened its new aluminum plant in New Orleans (p. 62) . . . Some $47.6 billion in military contracts have been placed since the Korean war began (p. 63) . . . American Steel Foundries will operate the government-owned East Chicago, Ind., steel foundry (p. 63) . . . The railroads are in fairly good shape for equipment but are still plagued by financing and materials problems (p. 64) . . . A new plan to expedite production of components for the military may be another blow to civilian goods makers (p. 66) . . . France has materials troubles; Belgium is embarrassed by riches (pp. 72-73).



Shown here are two reducers—a STANDARD, at left, a SPECIAL at right. Yet, except for the housing, parts are completely interchangeable.





SPECIAL REDUCERS do not REQUIRE SPECIAL PARTS

By specifying Cone-Drive DOUBLE-enveloping Gears when you need a special reducer, you can, in most cases, retain all the cost, delivery and reconversion advantages resulting from use of STANDARDIZED gears, shafts, bearings, carriers, etc.

This interchangeability applies whether the reducer is fin-cooled, water cooled or fan cooled. Except for gear and worm teeth, as a matter of fact, all reducers of the same center distance have interchangeable parts.

On top of that, when you specify Cone-Drive Gears, you get the remarkable compactness of DOUBLE-enveloping gearing at no extra cost.

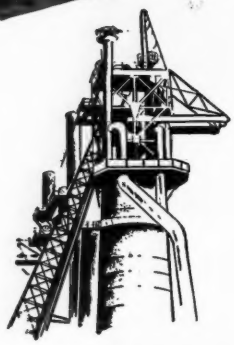
Write today for the name of the Cone-Drive Gears Representative in your territory.

CONE-DRIVE GEARS

Division, Michigan Tool Company

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

7171 E. McNichols Road • Detroit 12, Michigan



EC&M Skip-Hoist Controller Helps Speed Round-the-clock Charging

Expected furnace capacity at the time of construction was 1250 tons per day or 38,750 tons a month. A recent month's output was over 50,000 tons (nearly 30% above the planned capacity). Contributing to increased output is the high speed operation of this skip-hoist made possible by the many advantages found in the EC&M Rheostatic Method of Control. These are:

1. **Adjustable control**—allowing up to double the running speed on the straight part of the track for reduced charging time. Full field strength and maximum torque for acceleration, and at slow down for accurate stopping—either with an empty bucket or capacity ore load.
2. **Low initial investment**—and low standby renewal part inventory.
3. **Simple construction**—easily inspected with minimum labor and upkeep expense.
4. **Safe, smooth operation** under all conditions of stone, coke or ore loads.

Consult with EC&M, without obligation, when considering control for blast furnace distributor-tops, bell-hoists, skip- hoists, etc.

NO DELAYS IN 8 YEARS

This is but one of several blast furnace skip-hoists used by this large steel maker and equipped with EC&M LINE-ARC Contactor Control. EC&M has recently built additional controllers for two new blast furnace skips for this company.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Remedy for Injustice

Three years ago the Justice Department obtained indictments against 14 paint manufacturing companies and 21 officials of these companies for alleged violation of the Sherman anti-trust laws. The companies and individuals were charged with conspiracy in fixing paint prices, discounts and allowances.

The story of these cases should interest thousands of metalworking companies because it demonstrates clearly what might have been the rainbow finish of numerous metalworking industry cases had the defendants been willing or financially able to fight for principle.

Here is the story: All defendant paint companies and individuals were confident they were innocent, yet they realized clearly they had two alternatives. Either they could plead "nolo contendere" and get off with a fine of a few thousand dollars or they could fight their cases in court which would cost many tens of thousands of dollars and consume months or years of time.

Twelve companies pleaded "nolo contendere" and were fined $5000 each. Twenty individuals pleaded similarly and were assessed fines ranging from $1000 to $3500 each. The twenty-first individual fought the indictment and the government dismissed its charges against him. The thirteenth and fourteenth companies—E. I. du Pont de Nemours & Co. and Glidden Co.—carried their fight to a federal district court where a jury acquitted them. It cost the Glidden Co. about $100,000 to prove its innocence and it may be assumed that du Pont spent as much or more. The companies and persons pleading "nolo contendere," although later found to be innocent, paid out more than $110,000 in what amounted to a virtual "shakedown" by their government.

This type of extortion cannot be justified on any score. The reason for it is that the anti-business atmosphere which has pervaded Washington in recent years makes it too easy for the Justice Department to obtain indictments on insufficient or faulty evidence.

One remedy would be to require the government to compensate the defendant for his costs if he is acquitted. This would force government lawyers to prepare their cases more carefully and it would encourage honest defendants—especially small ones—to fight to protect their good names.

E. L. Shaner

EDITOR-IN-CHIEF

WHEN BELTS TIGHTEN: In this week's "Mirrors of Motordom," Detroit Editor Howard Tuttle expands on the belief held by many persons in the automobile industry that Ford Motor Co. "is getting its product, its physical plant and its personnel in shape to do battle" with its adversary, Chevrolet, "to regain its place as the No. 1 auto builder." The climax

to this rivalry cannot come as long as a scarcity of cars exists, but in 1954 or 1955 or whenever supply again exceeds demand, competition between Ford and General Motors will be terrific.

Assuming that these surmises are true, think what the coming battle of giants will mean in terms of sharper scrutiny of the prices and quality of materials, components and parts; demands for higher productivity, more economy in manufacturing and more effective selling and distribution; and a general tightening of belts in every phase of manufacturing activity!

When the long awaited buyers' market returns, many wastes and inefficiencies now tolerated will go out the window. —p. 75

* * *

WANT MORE DIESELS: American railroads are placing in operation more new locomotives in 1951 than in any year since 1923. More orders for new locomotives were awarded in September of this year than in any month in history.

Diesel power figures heavily in these records. Of the 2135 locomotives installed during the first 10 months of this year, 2117 were diesel, 16 steam and 2 electric. Steel allotted for diesel-electric locomotives in first quarter will permit building only 233 units per month. The railroads want 400 a month. They point out that a decommissioned steam locomotive yields 165 tons of scrap while a new diesel requires only 120 tons of steel. They claim that last year they supplied 12 per cent of the steel industry's scrap but received only 7 per cent of its steel. —p. 64

* * *

TEST COAL PIPE LINE: Well worth watching will be the operation of an experimental pipe line to transport bituminous coal. Pittsburgh Consolidation Coal Co. has installed an 8000-foot long line of 12¾-inch pipe at Cadiz, O. and soon will extend it to 17,000 feet. At present the pipe line transports from 7000 to 9000 tons of coal daily. Fine sizes of coal are mixed with water to form a "slurry," which is pumped through the line in much the same manner as other liquids are propelled through pipe lines.

If tests of the experimental installation extending over a year indicate that the method is feasible, the line may be extended to the Great Lakes and to other large coal consuming areas and operated on a commercial basis. If to water, gas, oil and gasoline now being transported by pipe line, we add coal, what will be next? —p. 71

* * *

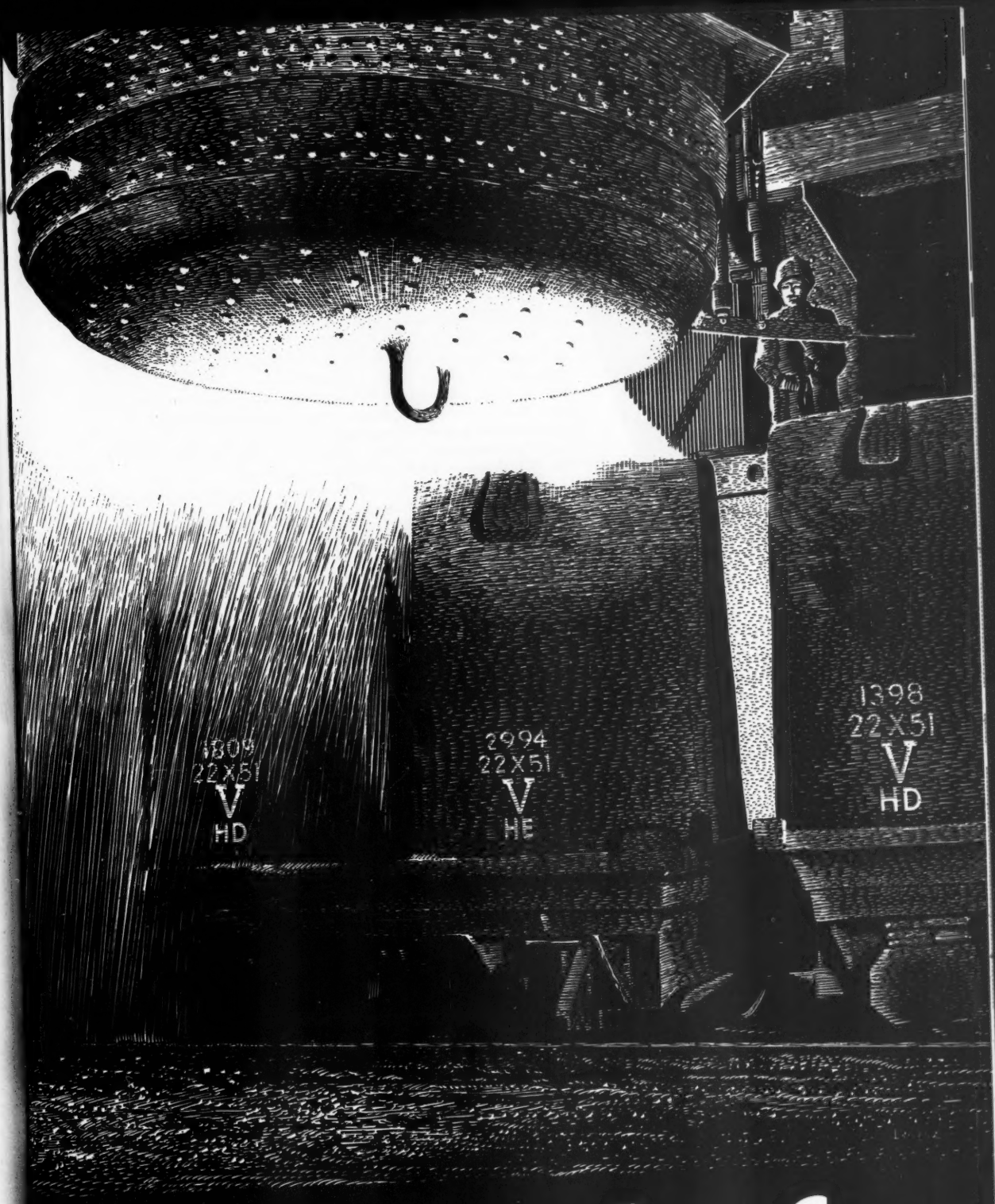
KAISER EMPIRE GROWS: Last Tuesday in ceremonies more elaborate than those which usually attend the opening of a new plant, Henry J. Kaiser, assisted by Defense Mobilizer Charles E. Wilson, poured the first aluminum from the Kaiser Aluminum & Chemical Corp.'s new Chalmette reduction plant on the outskirts of New Orleans. This event took place less than ten months after construction was started last Feb. 20.

With Chalmette pot lines in operation, the Kaiser interests enhance their position in the aluminum field substantially. When all of the contemplated eight pot lines at Chalmette are operating, Kaiser, with its reduction facilities at Mead and Spokane, Wash., will have an annual capacity of 790 million pounds, which is 28 per cent of the total capacity in the United States. Included in the growing Kaiser empire are fabricating plants at Trentwood, Wash.; Newark, O.; Halethorpe, Md.; and Permanente, Calif. —p. 62

* * *

BEYOND TRIAL STAGE: A paper presented by J. J. Munns, vice president of Weirton Steel Co., at the regional meeting of American Iron & Steel Institute in Cleveland recounts steps leading to the development of "differential" coating of tin plate. The term "differential" is used to designate the application of a different coating weight to each side of the sheet. The process has great potential for conserving tin.

Weirton first demonstrated the feasibility of differential coating in World War II when it produced gild clad steel strip for bullet jackets carrying 15 per cent copper on one side and 5 per cent copper on the other side of a steel base. Its first experimental production of differential tin plate occurred on June 8, 1949. On Feb. 12, 1951, it announced differential coated electrolytic tin plate was available commercially in five combinations. First shipments were made on Mar. 7 and by Nov. 1 a total of 203,496 base boxes had been shipped. This definitely advances it far beyond the experimental stage. —p. 102



VALLEY MOULD AND IRON CORP.

General Offices: HUBBARD, OHIO

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"How'd you like to save $1.50 on every one of those packages?," asked Ed

Two men stood watching the steel unloading operation. "Say Dave—aren't those 6,000 pound lifts you're using?"

Ed Browning, an Inland "trouble shooter" on shipping and handling problems, was visiting the plant of a large manufacturer of hydraulic hoists and dump bodies. This customer had been ordering 42" x 96" hot rolled sheets from Inland in 6,000 pound lifts. As he stood on the unloading dock with Dave Nordstrom, the customer's purchasing agent, Ed observed that the practice was to remove only a few sheets at a time from the lift because their equipment couldn't handle a complete package that heavy.

"Yes, Ed, those are 6,000 pound packages. Why?"

"I'll bet that's a holdover from old packaging prices. If you can use 10,000 pound lifts, you'll save $1.50 on every package."

"Well," said Dave, "we can soon find out." A check with the receiving foreman confirmed that it would be just as easy to break down five ton as three ton lifts for unloading.

Result: The very substantial saving of $1.50 per lift on the large volume used by this Inland customer. INLAND STEEL COMPANY, 38 S. Dearborn St., Chicago 3, Ill.

Names used are fictitious

6
5
4
Inland's interest in your steel problems does not stop at our shipping dock
Your Scrap is Needed by the Steel Industry for National Defense

Capehart: Pitfall in Pricing

The Capehart pricing formula that was supposed to permit higher prices won't do so in many cases, at least as OPS has applied it to CPR 22 and 30

"THE CAPEHART formula as set up by OPS is a snare and a delusion to me and, I'll bet, to many other companies."

So says a Cleveland industrialist who, like most business men, thought an amendment passed late last summer to the Defense Production Act of 1950 and authored by Sen. Homer Capehart (Rep., Ind.), would permit rising labor, materials and overhead costs to be reflected up to July 26, 1951, in industrial prices. That undoubtedly was what the senator had in mind, but that's not the way it has always worked out, at least as it applies to those companies who come under Office of Price Stabilization's CPR 22 or 30. The prices for the overwhelming majority of metalworking companies are controlled by one or the other of those regulations.

The Score—Palley Mfg. Co., Pittsburgh, last week hadn't finished the voluminous calculations required under Capehart, but in a STEEL survey on the subject it predicted that it "would have some rollbacks" if it uses the formula. Another Pittsburgh manufacturer c a l c u l a t e s that its prices would be 2 to 3 per cent lower under Capehart than under the old CPR 22. A Youngstown firm discovered its prices would be 10 per cent lower under Capehart than under CPR 30. In spot checks STEEL found only two companies—one in Cincinnati and Ford Motor Co. in Detroit—that last week had finished their calculations and had discovered that Capehart would help them. Under Capehart, Ford can increase wholesale prices on tractors an average of 6.3 per cent. Industrial engine wholesale prices can be boosted 3 per cent, and the boosts on service parts and accessories can rise about 3 per cent.

Ramifications of OPS's Capehart formula are only just now being discovered by industry. In two days—on Dec. 19—the bulk of all companies who are not yet under a tailored pricing order and have not yet changed from the old General Ceiling Price Regulation to CPR 22 or 30 must do so. Some producers, such as those in the stamping, nut and bolt or fabricated structural steel business, may stay under GCPR because a tailored pricing order is due soon. A company may elect to use the Capehart provisions at its discretion and at any date it pleases, but many companies are figuring the advantages or disadvantages now—both because they need price relief and because they are in the throes of a switchover to CPR 22 or 30 anyway.

Disillusion — "Most—but not all—companies will stay with the old CPR 22 or 30," predicts a New York accountant. "By accident or design, OPS has emasculated the force of the Capehart amendment as it applies to most companies." Here's why: Under the regular CPR 22 or 30, a manufacturer may figure labor cost increases into his prices by picking as his base period any quarter from July 1, 1949, to June 30, 1950, and calculating the increases from then to Mar. 15, 1951. Any materials cost increase may be figured into his prices by carrying forward the cost hikes from the same quarter to Dec. 31, 1950 (or Mar. 15, 1951, in some instances such as fabricated structural steel). Under Capehart, a manufacturer may figure labor, materials and administrative overhead costs into his prices by calculating the increases from the base period—first half of 1950 or either quarter in that half—to July 26, 1951. The change in base periods is the crux of the matter.

Fair enough? Not always. In the span under which regular CPR 22 or 30 operates—July 1, 1949, to Jan. 1 or Mar. 15, 1951—costs rose more sharply than in the period for Capehart—Jan. 1, 1950 to July 26, 1951. Thus, the percentage gain under the older system is usually higher than under Capehart. But overhead is allowed under Capehart. Doesn't that help? Some, but usually not enough. Under the regular setup, many special labor and material costs usually figured as overhead are already allowed. So Capehart doesn't give as great an advantage there as might be expected.

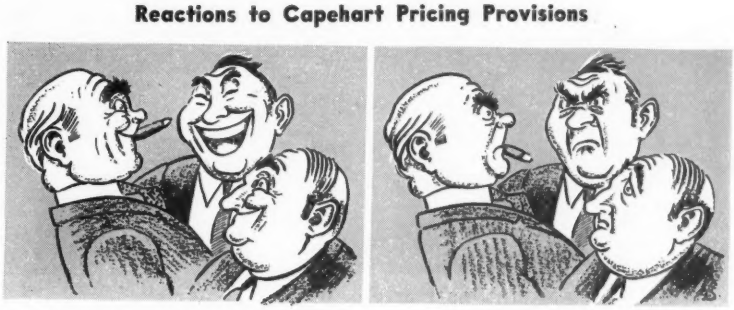
The Case of XYZ Mfg. Co.—Take XYZ Mfg. Co. It sold a device for $100 in July, 1949. Steel and other materials cost increases, plus higher labor rates, pushed its costs up sharply by April, 1950, but a competitive market then forced XYZ to absorb part of those cost gains and boost its price to only $105. The steel price jump of December, 1950, pushed the quotation to $111 in that month. By Jan. 15, 1951, its employees had won a big pay raise and the price was pushed to $120 where it stayed under GCPR, later CPR 30.

Under CPR 30, the price remains at $120. But labor, materials and overhead have gone up since the cutoff date for CPR 30, so it calculates under Capehart. It finds that total costs from the Capehart base period—the first half of 1950—have risen 13 per cent as of July 26, 1951. The base period price was $105; 13 per cent of that is $13.65, so the Capehart price would become $118.65. The CPR 30 price is $120.

The Case of ABC Mfg. Co.—ABC Mfg. Co. is in better shape. It didn't have a tough competitive position in the first half of 1950, although all its other conditions were exactly the same as XYZ's. So, instead of holding its prices to $105 in the first half of 1950, ABC raised to $110; 13 per cent of that is $14.30, so the Capehart price would become $124.30. The CPR price is $120. The catch is that most companies are not as fortunate as ABC. Competition or other factors kept their prices down in the crucial first half of 1950. At that time, remember, there was no hint of a Korean war or any other price gyrations.

Capehart provisions are working

Reactions to Capehart Pricing Provisions



. . . at amendment's passage *. . . after OPS implementation*

out better for the tailored price regulations thus far written than for CPR 22 or 30 because the base period for those has not been manipulated as for 22 and 30, and the calculations reduce to figuring the cost gains from the old cutoff dates to July 26, 1951. The hope for most companies under 22 or 30 is not Capehart provisions applied to those regulations, but new tailored pricing rules. OPS Boss Michael DiSalle says they're coming.

Not Using Capehart

Steel producers, when they're entitled to advances under the Capehart amendment, are showing patriotism by not boosting prices, Inland Steel Co. President Clarence B. Randall last week told the Northern California Chapter of American Steel Warehouse Association.

He says wage boosts mean another drink at the inflation bowl. He sees unmistakable signs of steel supply-demand approaching balance, but it's impossible to foretell the government's spending plans. Walter S. Doxsey, president of the association, declares there's a definite letup in demand for flat-rolled products, not including galvanized. He foresees an easing of demand for structural in the first quarter.

Kaiser Pours First Aluminum in New Chalmette Plant

FIRST ALUMINUM in Kaiser Aluminum & Chemical Corp.'s new $150 million Chalmette reduction plant near New Orleans was poured last Tuesday by fabulous Henry J. Kaiser aided by Defense Mobilizer Wilson.

First of eight pot lines went into operation less than ten months after initial construction in February. Originally the plant was to have four lines with a capacity of 100,000 tons annually. Last month Kaiser signed a government contract to double its size. When completed in mid-1953 the plant will have 16 pot-room buildings —two for each pot line, side by side. Each room will have 72 Soderberg-type pots with individual capacity of 40 pounds per hour.

Electric power for six lines will be provided by a steam power plant with 16 ac generators and a rectifier station for converting alternating current to direct current needed in the reduction process. Two pot lines will be served by eighty 1650-horsepower Nordberg radial gas engines, each driving a dc generator. Both types of power plant will use 50 billion cubic feet of natural gas per year.

Kaiser's Share—Alumina will be delivered by rail to the Chalmette plant from Kaiser's Baton Rouge plant 80 miles away. It will be delivered on an elevated 24-inch conveyor belt directly to the storage bins in each pot room. Bauxite for Baton Rouge comes from Kaiser properties in Jamaica.

Chalmette and reduction plants at Mead and Spokane, Wash., will give Kaiser capacity of 790 million pounds annually or 28 per cent of the U. S. total.

POURING FIRST ALUMINUM AT CHALMETTE

. . . pouring honors done by Defense Mobilizer Wilson, Henry J. Kaiser

Power for Aluminum Plants

More than $20 million worth of General Electric equipment is being readied for installation in two new aluminum plants. Nearly $13 million worth of generators and turbines was ordered by Kaiser Aluminum & Chemical Corp. for a new four-pot-line reduction plant at Chalmette, La. A separate $8 million order was placed by Reynolds Metals Co. for its two-pot-line installation under construction near Corpus Christi, Tex.

In line with plans to increase the aluminum industry's overall production to about 2.5 billion pounds annually, the two new plants are designed for an aggregate output of 550 million pounds of the vital defense metal each year.

Anaconda-Harvey Gets DPA Nod

Anaconda Copper Mining Co. and Harvey Machine Co. are the best bet of all applicants to run the proposed 72,000 ton aluminum reduction plant at Kalispell, Mont., said DPA Administrator Manly Fleischmann. He requested Secretary of the Interior Oscar Chapman to enter negotiations with the two companies immediately to supply the plant with power from the Hungry Horse Dam project.

DMPA To Subsidize Copper

Copper producers can look for over-ceiling prices from government if they can't turn out the metal at present price ceilings, says Jess Larson's Defense Materials Procurement Agency.

Negotiations are under way for individual over-ceiling-price contracts with operators of nine mines having annual production of 16,000 tons—only a fraction of the industry's annual capacity of over 1 million tons. Present ceiling price on copper is 24.5 cents a pound.

Ore Carriers Close Good Season

The Great Lakes iron ore carriers came within a hair's breadth of attaining their goal for the 1951 shipping season, bringing down 89,092,012 tons of ore from upper lake ports.

That's about 900,000 tons short of the 90-million-ton goal, but well over the 1950 season's total of 78,205,681 tons. The carriers certainly would have made up this small shortage except for a cold snap which came early in November, freezing the ore in railroad cars at the loading docks and tying up the boats at upper ports. Working in favor of the carriers was the length of the shipping season—260 days, 15 days longer than the 1950 season.

Rearmament: Fast Enough?

There's no agreement on that question, although deliveries are now $1.5 billion monthly

ARE WE or are we not producing enough military goods?

Military secrecy veils the complete answer to that question. Accusations and praise from congressional committees confuse the issue. The Senate subcommittee of Sen. Lyndon Johnson (Tex., Dem.) says the U. S. isn't getting weapons fast enough from the $118 million voted by Congress for defense in the 18 months since the Korean War began. But Sen. Burnet Maybank (Dem., S. C.) and his House-Senate committee praise the defense planners for a "reasonable middle course." If shortages in military hard goods exist, the worst is probably in aircraft.

A Lot of Money—From July, 1950, through October, 1951, the Army, Navy and Air Force placed $47.6 billion worth of contracts for equipment, supplies and construction. Procurement now is at the rate of between $4 billion and $5 billion a month. Those figures include the Mutual Defense Assistance Program.

In fiscal 1951 $27.9 billion worth of orders were placed for aircraft, ships, tanks, weapons, ammunition and other hard goods; $4 billion went for clothing, subsistence, petroleum products and other soft goods; $3.4 billion worth of construction was contracted. In fiscal 1952 $37.9 billion worth of hard goods is being ordered, $4 billion worth of soft goods and $5.7 billion worth of construction.

A Lot of Goods—Rate of military deliveries to the Armed Forces is estimated by the Office of Defense Mobilization at $1.5 billion per month, and it's expected to reach about $4 billion per month in another year.

A report by the Council of Economic Advisors shows that at the end of 1950, the Armed Forces were taking 8 per cent of all the goods and service produced in the U. S. The proportion is now approaching 15 per cent. One year from now, the peak of military procurement may take about 20 per cent. The peak in World War II procurement occurred in the last quarter of 1944 when 45 per cent of national production went to war.

A Lot of Help—From March, 1950, through September, 1951, foreign military aid went this way: $4760 million in contracts placed for Europe, with $1021 million worth delivered; $473 million in contracts placed for the Near East and Africa, with $182 million delivered; $494 million in contracts for Asia and the Pacific islands, with $180 million delivered.

KEEPING UP WITH THE JETS: Electric-powered assembly lines are speeding the production of jet airplanes at Lockheed Aircraft Corp., Burbank, Calif. New mass production techniques will cut an estimated 40.5 man-hours of production work off each plane. The T-33's are the only jet trainers ordered by the U. S. services and are also going overseas

Giant Foundry Redrafted

American Steel Foundries will make tank hulls, turrets in government-owned plant

THE TRICKLE of heavy duty armor castings from the government-owned cast armor plant at East Chicago, Ind., will soon become a torrential flow.

American Steel Foundries got a multi-million dollar contract from Army Ordnance for complete reactivation of the plant and production of a large number of tank hulls and turrets. The contract will put what is reported to be the world's largest steel foundry back into full operation by next fall.

Built during World War II at a cost of approximately $26 million, the plant was retained by the government as a reserve industrial facility and used partially for storage of surplus equipment by the War Assets Administration. The wartime output of the plant in World War II totaled more than 70,000 tons of tested heavy duty castings, chiefly tank turrets.

Higher Peak — Some 2400 persons are currently employed at the plant which has been undergoing reconditioning for the past several months under a letter order agreement. Employment is expected to reach more than 6000 as compared with a peak employment during World War II of about 4000 persons.

C. C. Jarchow, president of American Steel Foundries, says about 90 per cent of the materials to be used in the production are basic raw materials that will receive practically all of their processing within the plant. The plant area consists of some 90 acres (30 acres under roof) located on the Indiana Harbor canal. The plant has six open hearth furnaces.

U. S. Studies Steel Dispute

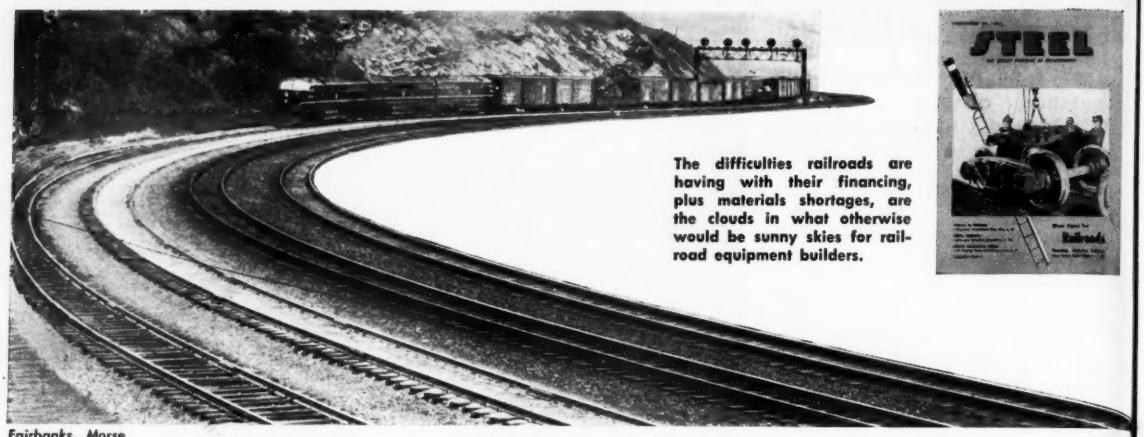
Fourth week of contract negotiations in Pittsburgh finds a third party in the act—government. It's the one, not U. S. Steel Corp. or the United Steelworkers-CIO, that may ultimately decide the wage-price problem.

The White House, worried by dragging wage talks and mention of few specific issues, ordered Federal Mediation Chief Cyrus Ching to move in. Top trouble shooters of the federal conciliation service conferred with negotiators for both sides to report back to Washington on width of the gap between company and union.

Hourly Wages up 21.7 Cents

Wages paid to iron and steel workers were 21.7 cents an hour higher in the first ten months of 1951 than during the corresponding 1950 period, according to American Iron & Steel Institute figures. That would be substantially more than the announced 16 to 18 cents hourly raise granted late in 1950.

Payroll of the iron and steel industry totaled $249,856,000 in October, and wage earners were paid an average of $1.931 an hour.



The difficulties railroads are having with their financing, plus materials shortages, are the clouds in what otherwise would be sunny skies for railroad equipment builders.

Fairbanks, Morse

Clear Signal for Railroads—if Obstacles Can Be By-Passed

By E. F. Ross, *Chicago Editor*

THE TRACK looks clear for American railroads, but boulders may be lying on the bend just ahead.

From the equipment and facilities standpoint, railroads now are in better shape to serve the defense effort than at any time in their history. Yet an equipment betterment program must be kept going and that continuance is now threatened by financing problems and materials shortages, especially in steel.

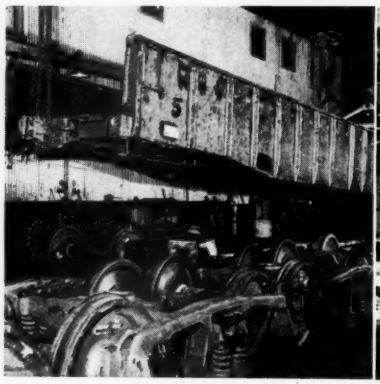
More and More — At present the roads have approximately 48,000 more freight cars than at the beginning of World War II and some 12,000 new units of motive power, mostly diesels. In the first five years after the war more than $5 billion was spent to improve operations and enlarge capacity. Spending is continuing at a rate of over $1 billion a year, with the 1951 budget approaching $1.45 billion.

But annual operating expenses have risen $1 billion since the last permanent increase in freight rates allowed two years ago, and the interim increase granted last August will bring in only half of that. Since 1939, rail wages have risen 140 per cent, materials costs 130 per cent and commodities 125 per cent. In the same period, freight rates as measured by average revenue per ton mile have advanced only 45 per cent.

Below the Surface — Net income of the carriers this year will exceed $600 million, below the $783 million of 1950, but comparable with average annual profits of other recent years. Those earnings sound satisfactory, but credit is at low ebb and equity capital is not readily available. Much of earnings must go to capital expenditures, and prices of goods and services are up sharply. For example, box cars have nearly doubled in price.

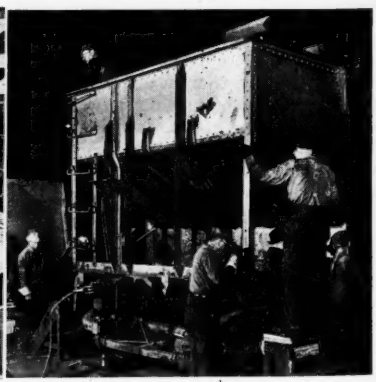
To get relief, the railroads some time ago asked the Interstate Commerce Commission to reconsider its decision on rate advances and to authorize the full 15 per cent increase requested last March. Early this month, the commission agreed to take another look and hearings have been set for Jan. 14. Favorable action on the request would mean further increase of approximately 6 per cent in eastern territory and about 9 per cent elsewhere. Two interim increases have already been granted, bringing the total to 9 per cent in the eastern territory and 6 per cent elsewhere.

Depreciation—In connection with financial matters, the ICC has heard final arguments on how fast railroads should be allowed to write off certain new equipment. DPA has permitted many roads to amortize new equipment for tax purposes in a five-year period rather than the normal 20 years. That is the same treatment accorded to defense industries, but



BETHLEHEM STEEL
. . . gondola car goes down

PACIFIC CAR & FOUNDRY
fiber glass for refrigerator car



PULLMAN-STANDARD
. . . putting together a hopper car

the ICC opposes its application to the railroads.

Revenue freight car loadings for 48 weeks of 1951 ended with Dec. 1 aggregated 37,797,094 cars. That's an increase of 1,784,075 cars, or 4.7 per cent, over the comparable period of 1950. Full year 1951 loadings will stack up as the best since 1948 when a record 42,718,828-car total was amassed.

Not So Bad — The freight car shortage will not be as bad as predicted last spring when railroad men were forecasting the worst pinch in history. The squeeze still is tight, but not as bad as six months or a year ago. Reason is that big defense output has not materialized so far and supply of cars has improved. Car shortages now are only about 9000 per day, compared with 32,000 a year ago.

ICC estimates that Class I railroads will outlay this year for property improvements a record $1.45 billion for new equipment and other capital improvements. This would be about 37 per cent over 1950 and 11 per cent over the previous record in 1949. But the general price level has advanced since those earlier years, and the actual number of various equipment units and quantities of roadway materials purchased may not be as large as in some former years.

Postwar Spending — Since World War II, the railroads have spent close to $6 billion dollars for more than 400,000 new cars, 13,000 units of diesel-electric power and nearly 400 steam and electric locomotives, heavier rails, new yards and terminals, better shops, improved signals and communications.

Bulk of expenditures this year will be for new cars and locomotives. It is expected they will take about $1.1 billion, a figure 42 per cent greater than 1950. To date, roads either have received delivery or have on order a total of about 230,000 cars under the present building program. Defense Transport Administration warns this figure must be boosted to at least 300,000 to meet the increasing transportation volume that is ahead for the country.

Output Up—New freight car deliveries during 11 months this year totaled 87,406. Only in one month—October, when 10,082 cars were built—did output attain the 10,000 car level sought. November, with 9824, approached the goal and was second best. Deliveries for the full year 1950 were 43,991. Backlog of cars on orders as of Dec. 1, this year, stands at 129,158, compared with 124,489 as of Jan. 1, 1951, and 12,036 as of Jan. 1, 1950.

In 10 months through October this year, 2135 new locomotives have been installed. These included 2117 diesel, 16 steam and 2 electric. When the year's tabulation is complete, it is certain that the highest installation for the past 28 years will have been set.

Locomotives on order as of Nov. 1 this year numbered 1742, nearly double the backlog as of Jan. 1, 1950. Orders for more new locomotives—549—were placed in September this year than in any other month on record.

Problem of Displacement—Dieselization of railroad motive power in recent years has brought disaster to a segment of the railroad equipment and supply industry. By late 1949 some firms had seen 65 to 70 per cent of their market vanish with declining popularity of the steam locomotive. Some gave up business and others sought new fields.

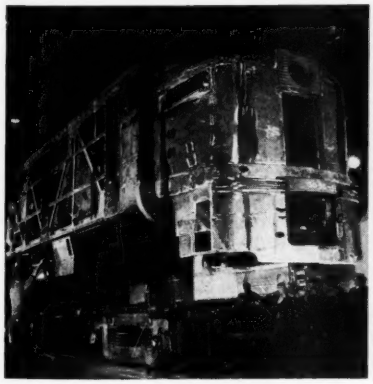
Those making such items as headlights and wheels retained comfortable and expanding business. Hard hit were manufacturers of firebrick for fireboxes, injectors, packing and gaskets, and chemicals for water treatment.

Matter of Scarcities—During the last half of 1951, growing scarcities of steel and other metals forced reduced allocations to the railroads and to car and locomotive builders. The cuts are being extended even more deeply into first quarter, 1951, and are certain to bring reduced output of rolling stock to jeopardize the rail transportation system.

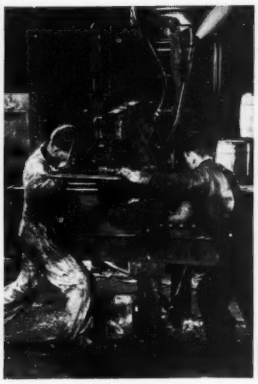
Throughout 1951, the domestic freight car production program goal was pegged at 10,000 cars per month. Direct allocations of steel to produce that many cars were made to builders for the first six months, but the manufacturing program made headway slowly. Starting July 1, builders got only enough steel allocated to make 7600 cars per month, although inventory supplies enabled them to deliver more in October and November. For first quarter, 1952, the car program has been cut from the former 10,000 per month goal to only 6000. And not enough steel has been allocated to support the latter figure. The first quarter car production may barely balance the amount of car retirements.

Below Minimum—Steel for diesel-electric locomotives next quarter, will permit manufacturing of only 233 units per month. Railroads want 400 a month, with 300 as an absolute minimum. The railroads point out that a retired steam locomotive gives 165 tons of scrap, while only 120 tons of steel is required for a new diesel. Railroads claim they furnished 12 per cent of the steel industry's scrap last year and got only 7 per cent of steel production in return.

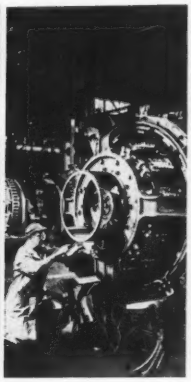
The outlook for steel rails isn't very bright, either. The carriers usually lay rails at the rate of 385,000 tons a quarter, but for the January-March period, next year, they have been cut to about 320,000 tons.



AMERICAN LOCOMOTIVE
. . . setting it on wheel trucks



PRESSED STEEL CAR
. . . pneumatic riveting



GM ELECTRO-MOTIVE
. . . generator test

BALDWIN-LIMA-HAMILTON
. . . diesel shop

A PANORAMA OF SCRAP: Piled high on the outskirts of the Philadelphia Naval Base are tons of usable scrap, which are speedily converted and loaded for shipment to the nation's steel mills. Five hundred tons of scrap, translated into terms of weapons for our armed forces, is equivalent in weight to about 107,000 bazookas or 13,300 fifty-caliber machine guns

Ammunition and Small Arms Contracts Continue to Grow

NEW CONTRACTS in the ammunition and small arms field are appearing regularly, following statements from government officials that stockpiles and reserves are dwindling. At least one contract announced this week is for a standard military item which has not been produced since the end of World War II.

International Harvester Co. has awarded a multi-million dollar order for production of the Garand M1 semi-automatic rifle. This is the first contract for the guns since World War II, when all but limited spare parts production was discontinued. International is now tooling its Evansville, Ind., plant for the job and deliveries are expected to begin in early 1952. An estimated 1500 employees will be needed when production reaches a peak.

Chevrolet Div., General Motors Corp., has been awarded another artillery shell contract which more than doubles its original contract of last March of $25 million for the production of artillery shells.

A contract to make breech rings for the Army's 90-millimeter guns has been awarded to York Corp., York, Pa. The contract is valued at over $1 million.

Other contracts awarded by the government, in excess of $250,000 follow:

Product	Contractor
Road Graders (2 Contracts)	Rome Grader Corp., Rome, N. Y.
Tractors	Little Giant Tree Feller Corp., Dallas
	Minneapolis-Moline Co., Minneapolis
Oil Burning Ranges	Vulcan-Hart Mfg. Co., Louisville, Ky.
Locker Boxes	F. A. Whitney Carriage Co., New York
	Armored Trunk Mfg. Co., Hawthorne, Calif.
	United States Trunk Co. Inc., Fall River, Mass.
	Gueli Woodworking Corp., Brooklyn, N. Y.
	Bingley Inc., Brooklyn, N. Y.
Sterilizers, Boiling Type	Pelton & Crane Co., Detroit
Practice Rocket Head Assemblies	Norwalk Lock Co., South Norwalk, Conn.
Percussion Primers	Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Grenade Projection Adapter	G. K. Garrett Co. Inc., Philadelphia
Photoflash Bomb	Allen Mfg. Co., Nashville, Tenn.
Fuzes	Supreme Knitting Machine Co. Inc., Brooklyn, N. Y.
	Snap Tite Inc., Union City, Pa.
Cartridge Cases	Norris Thermador Corp., Los Angeles
Collective Protector, Field M 6	Mission Appliance Corp., Hawthorne, Calif.
Final Drive Couplings	Warner Machine Products Inc., Muncie, Ind.
Indicator Ring Receptacle	Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Master Junction Box	Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Maintenance Parts	Chance Vought Aircraft Div., United Aircraft Corp., Dallas
Tank and Combat Vehicle Parts	American Generator & Armature Co., Chicago
	Detroit Michigan Stove Co., Battle Creek, Mich.
	Active Gear Co., Chicago
	Maxim Silencer Co., Hartford, Conn.
Harbor Tugs	Fellows & Stewart Inc., Wilmington, Calif.
	American Boiler Works, Erie, Pa.
Receivers and Transmitters	Delco Radio Div., General Motors Corp., Kokomo, Ind.
Ringer Sets	Kellogg Switchboard & Supply Co., Chicago
Electron Tubes	Raytheon Mfg. Co., Waltham, Mass.
Tube Testers	Triplett Electrical Instrument Co., Bluffton, O.
Teletype Parts	Teletype Corp., Chicago

Tighter Components

New program aims at speeding their production for the military and defense-related projects

MORE TROUBLE looms ahead for buyers of equipment for civilian purposes as result of a new formalized policy and procedure covering components.

Under it, military and Atomic Energy Commission needs and the plant expansion programs in steel, aluminum, copper, electric power, rubber, aircraft, machine tools, etc. will be given right-of-way. "Where interference or displacement cannot be avoided" said Manly Fleischmann, NPA administrator, "non-defense production will give way to defense production."

Spot Basis—Just as NPA long ago reached the point on materials where it had to allocate, now it is reaching the point where comparable controls over production and shipment of components are necessary. Instead of full-blown controls, as those applying to materials under the Controlled Materials Plan, the controls over components will vary in accordance with the particular items. In most cases it should be necessary only to expedite production and delivery of certain components for certain defense end-items. That can be done, often over the telephone, by "spot scheduling."

In most cases there will be no attempt to control the entire production and shipment of any particular component as that would take a great many more NPA employees than can be hired on the basis of this year's appropriation. But where it is necessary to control the entire output, the particular component will be controlled from an "order board" in Washington—similar to the setup under which machine tool production and shipments now are controlled.

For Cranes—One of the first order boards to be set up will cover components for steel mill cranes to eliminate one of the major bottlenecks in the steel mill expansion program.

NPA officials are not prepared to say what components at the outset will need controls; the new move is not so much intended to meet present difficulties as to anticipate those that are expected in first half of 1952 when needs for swelling military end-item production, as aircraft, and needs to complete the various plant expansion programs will move to high-water marks. Some of the components which are beginning to require expediting help include exchangers, pumps, valves, electric motors, bolts and nuts, other fastening

devices and electric generating equipment of certain kinds.

More Allotments—Said Mr. Fleischmann: "We are going to do two things to help on components for which the demand is larger than the supply. We will issue directives covering production and delivery. And we will grant supplemental materials allotments so that these production directives may be carried out."

Asked to estimate the effect of the new policy in cutting already curtailed production of many consumer items, Mr. Fleischmann said that he could offer no statistics. He hoped that intelligent handling of the various components would be possible without major disturbance to civilians but admitted there might be such an effect. He went on to express the fear that some further cuts in permissible civilian production would have to be ordered during first quarter of 1952 because of materials shortages.

Hard Hit? Help's In Sight

Manufacturers especially hard hit by materials cutbacks in the first quarter will get some help from NPA. The agency says it will allow extra, small allotments of scarce materials to two types of users—manufacturers who are unable to make substitutions to compensate for reduced first-quarter allotments of copper and aluminum and small single-line producers of least essential items who cannot operate under existing first-quarter allotments.

NPA emphasizes that reserves of steel, copper and aluminum controlled materials available for hardship cases are small and include no brass mill products. Applications for supplemental allotments must be filed with the appropriate NPA industry division on Form CMP-4B. NPA said no supplemental allotments in hardship cases were to be made until Dec. 15.

NPA Gives New Priority

Machine tool builders have a new and stronger priority label, Z-2, to apply on their orders for steel, copper, aluminum and component parts.

NPA says producers of these materials are required to give top preference to orders bearing this symbol, as well as to orders carrying military and atomic priority designations. The step was taken to bolster machine tool makers as a key factor in the entire defense expansion effort.

Peak Steel Output in 10 Months

More steel was shipped in the first 10 months of this year than in any full year prior to 1950, the American Iron & Steel Institute reports.

The shipments during the period totaled about 65,981,000 tons, an increase of 11 per cent over the first ten months of last year. In 1948 the 12-month total was about 7000 tons less than the present ten-month aggregate. The wartime record was 63.2 million tons in 1944. Total steel shipments in October were 6,844,000 tons, a little more than 5 per cent above those of one year earlier.

Shipments of alloy steel other than stainless in ten months were 4,790,700 tons, 25 per cent higher than in the similar 1950 period, while shipments of 446,100 tons of stainless steel showed a gain of more than 21 per cent. Shipments of plates constituted 9.9 per cent of total shipments so far this year, against 7.7 per cent in the similar 1950 period. Structural shapes rose to 6.2 per cent from 5.8. Shipments of cold-rolled sheet dropped to 12.2 from 13 per cent, although the actual quantity of that product increased to more than 8 million tons from 7.7 million in the 1950 span, thus remaining the largest tonnage product.

The one hundred millionth ton of steel was poured this last week—the first time that production mark has been reached during a calendar year.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

SELENIUM—NPA Order M-91, issued and made effective Dec. 10, 1951, places imported and domestically produced selenium under complete allocation.

AUTO WRECKERS—NPA Order M-92, issued and made effective Dec. 11, 1951, requires an inventory report from automobile wreckers by Dec. 20, 1951, covering the number of motor vehicle and car units and the poundage of loose scrap; limits auto wreckers in their acceptance of delivery of motor vehicles or car units; requires quarterly turnover of motor vehicles manufactured prior to 1946; and requires auto wreckers to comply with NPA allocation directives.

Price Regulations

PRICE ADJUSTMENTS — General Overriding Regulation 21, effective Dec. 5, 1951, establishes the basic procedure in accordance with which most business concerns will be authorized to apply for an adjustment of their ceiling prices under the Capehart amendment of the Defense Production Act of 1950. GOR 21 is the most general of a series of regulations being issued to provide procedures for applying for adjustments.

PASSENGER AUTOMOBILES — Revision 1 of Supplementary Regulation 1 to Ceiling Price Regulation 1 provides for optional adjustment of ceiling prices of passenger automobiles under the Capehart amendment. Revision 1 was effective Dec. 12, 1951.

CONVERSION STEEL—Amendment 2 of Revision 1 of Ceiling Price Regulation 1 permits manufacturers of passenger automobiles to reflect in their ceiling prices increased costs resulting from use of more conversion steel than they used prior to June 30, 1950.

CASTINGS—Amendment 4 of Ceiling Price Regulation 60 corrects an error made in issuing Amendment 3. Amendment 4 inserts the cutoff date of July 30, 1951, in section 4 (a) (i) of CPR 60.

MACHINERY RESELLERS—Amendment 5 of Ceiling Price Regulation 67 revises the definition of "manufacturer" insofar as the definition presently contained in this machinery resellers' regulation embraces persons selling under their own brand or trade name. Amendment 5 was effective Dec. 15, 1951.

MACHINERY MANUFACTURERS—Amendment 24 of Ceiling Price Regulation 30 revises the definition of "manufacturer" to limit application of the regulation to those brand name manufacturers who produce the same or similar commodities in their own plant or who furnish the actual manufacturer of the commodity with the tools or dies used in production of the commodity. Amendment 24 was effective Dec. 15, 1951.

MANUFACTURERS—Amendment 1 of Supplementary Regulation 17 to Ceiling Price Regulation 22 permits manufacturers to file for permission to adjust the CPR 22 ceiling prices for commodities produced in a unit which meets the present requirements of section 16, except for the fact that there is an overlapping of commodities in the catch-all classifications. Amendment 1 was effective Dec. 10, 1951.

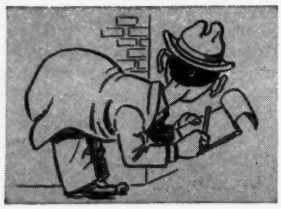
MACHINERY MANUFACTURERS—Amendment 1 of Supplementary Regulation 4 of Ceiling Price Regulation 30 was issued for the same reasons and accomplishes the same objectives as Amendment 1 of SR 17 of CPR 22.

AUTO EQUIPMENT — Amendment 3 of Revision 1 of Ceiling Price Regulation 1 permits an adjustment of ceiling prices for extra, special or optional equipment to reflect the same ceiling price adjustments previously authorized for the automobiles on which the equipment is used. Amendment 3 was effective Dec. 15, 1951.

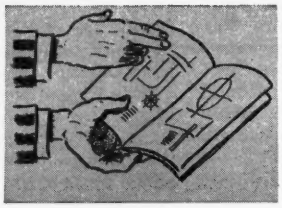
Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

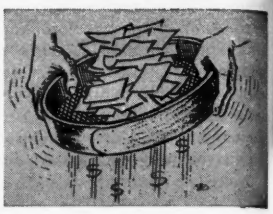
COAL MINERS BEAM
. . . Lewis fund swells



FEPC ENFORCEMENT
. . . contractors must comply



FREE PATENTS CATALOGED
. . . 2339 of them for $1



RFC SIFTS LOAN REQUESTS
. . . Symington sums up policy

CLOSE ATTENTION by industry to the coal miners' welfare and retirement fund, because of the trend of labor in other industries to demand something comparable, has caused opening of a special office of information to answer questions and give out data about the fund.

In charge is a former labor correspondent of the Associated Press, Harold W. Ward, who holds forth at the Office of Information, United Mine Workers of America Welfare & Retirement Fund, 907 Fifteenth St. N. W., Washington. His telephone number is EXecutive 5664. From Mr. Ward's office has come one of the significant labor-management documents of our times—the annual report of the fund for the fiscal year ending June 30, 1951.

Balance—This discloses that the fund has come a long way since it was set up in May of 1947. In that period of four years approximately 721,000 men, women and children received benefits of $254,018,265—and the job was done with total administrative expenses of $7,003,863.

The take, 30 cents for each ton of coal produced, is expected to be around $150 million in the fiscal year to end June 30, 1952. This royalty seems adequate not only to take care of the death benefits, pensions, medical and hospital payments and other benefits covered by the plan, but to support an accumulating cash reserve. Balance in the fund on June 30, 1951, after all expenditures, was more than $90 million. Thus the balance on hand is adequate to take care of any emergency situation that reasonably might be expected.

Plans — In the meantime, the original program is being broadened to carry out its purposes more adequately. Trustees of the fund—John L. Lewis, Josephine Roche and Charles A. Owen—have plans to build 10 hospitals for the benefit of miners in scattered soft coal areas where suitable facilities now are lacking.

Watch on the Woodpile . . .

A new FEPC aimed at industry is to be created under a new executive order of the President creating a Committee on Government Contract Compliance. The order points out that although for 10 years it has been mandatory to include in government contracts a clause prohibiting racial or religious discrimination in hiring and firing, compliance has been lax due to absence of enforcement procedure. The new board, still to be appointed, is to remedy this deficiency by drafting regulations and sending inspectors around to contractors' plants to see that they are obeyed.

Something for Nothing . . .

Patent holdings of the government are blossoming with the national emergency. Many patents to which the government has title covering important processes and apparatus may be used free of charge by United States firms by means of royalty-free, non-exclusive licenses. A catalog of these patents entitled "Government-owned Inventions for Free Use," was compiled by Dr. Archie M. Palmer, chairman of the Government Patent Board. The booklet lists and describes 2339 patents owned by the government that are available for licensing. Copies may be obtained for $1 from Superintendent of Documents, Government Printing Office, Washington 25.

No Giveaway Here . . .

For the enlightenment of those industrialists who would like to borrow money from the government, Stuart Symington, administrator, Reconstruction Finance Corp., sums up loan policies of that institution this way:

"The new lending policy interprets two statutory standards in the light of present conditions: Every loan must serve a public interest as well as a private need, and no loan should be made where financing could be had from private sources.

"Public interest today revolves primarily around what is best for our national defense. Loans now considered acceptable are those which either maintain essential civilian production and services, or actually promote conversion to defense production.

"The public interest in this mobilization period also demands the prohibition of what might be called inflationary lending. RFC wants no loans inconsistent with the aims of the Voluntary Credit Restraint program of the banks."

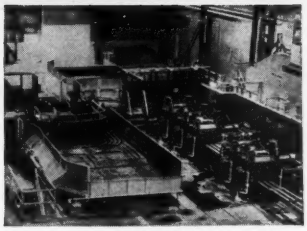
NPA's Loss Is SDPA's Gain . . .

National Production Authority lost a good man and Small Defense Plants Administration gained one in Albert J. Lubin.

Telford Taylor named Mr. Lubin SDPA's director of public information. In government information work for more than 15 years, Mr. Lubin for the past 15 months has been deputy director of public information for NPA and DPA.

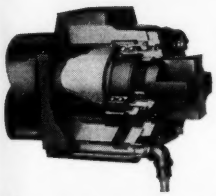
geared

TO HELP YOU PRODUCE MORE STEEL PRODUCTS



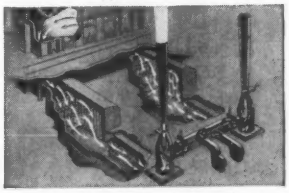
Continuous Rolling Mills

. . . built by specialists with over 60 years of pioneering in the field.



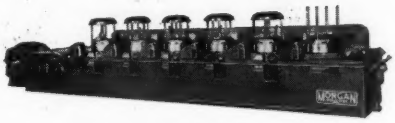
rgoil Roll Neck Bearings

will increase the accuracy of your duct and save on operating and tenance costs.



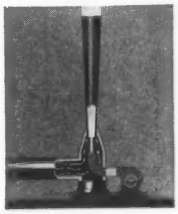
Furnace Control System

. . . Morgan-Isley increases efficiency of any regenerative furnace at relatively low installed cost.



Wire Machines

. . . Morgan-Connors give high production, with low die cost, low power cost, low space requirement.



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. . . efficiently handle hot gases and fumes as high as 3000° F.

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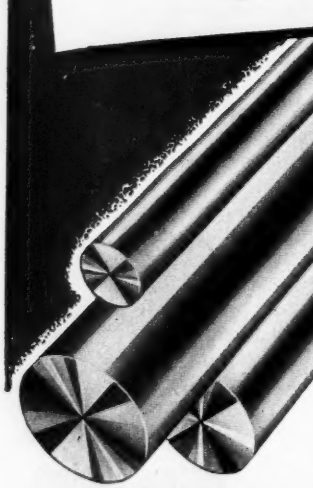

REPLACED *ALLOY* STEEL!

Originally, this compressor shaft was machined from A4615 alloy steel, then carburized, quenched, cleaned, straightened, and ground twice. When the manufacturer changed to new *Ground and Polished STRESSPROOF* for this part, machining was the only operation required—all other operations were eliminated! The result: faster production and an over-all savings of 59c per shaft.

This case is typical of the dramatic results possible with *Ground and Polished STRESSPROOF*—the finest ground bar steel produced. This bar eliminates many costly manufacturing operations because of its unique combination of four important qualities in-the-bar: strength... wearability... minimum warpage... accurate polished surface. And this sensational steel machines fully 50% faster than heat-treated alloys of the same hardness!

INVESTIGATE, NOW!

Most of today's Ground and Polished STRESSPROOF is going into defense jobs. Occasionally some sizes of bars are available for testing purposes.

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Coke Projects Win O.K.

Materials granted 39 undertakings that will produce 8.4 million tons of coke yearly

DEFENSE Solid Fuel Administration has allotted controlled materials to 39 coke oven and coal chemical construction projects for the first quarter of 1952.

Some government officials think that coke expansion has been lagging behind the increase in steelmaking facilities and that the imbalance will make it impossible to utilize fully the added ingot potential (STEEL, Nov. 12, p. 50).

Supply and Demand—DSFA Administrator Charles W. Connor estimates that the demand for coke will reach about 84 million tons by mid-1953, an increase of 11.3 million tons since 1950, but capacity by June, 1953, will be only 78 million tons despite "one of the largest coke oven construction programs in the industry's history." The 39 coke and coal chemical projects will cost $190.5 million and when completed will provide 8,395,000 tons of coke annually.

Mr. Connor points out that a large part of that capacity will merely replace old ovens which are being retired because they are over-age. "Past experience indicates," he says, "that we'll lose coke capacity of about 3.5 million tons a year for the next few years.

The Companies—The projects are being carried on by Youngstown Sheet & Tube Co., Ford Motor Co., Republic Steel Corp., American Steel & Wire Co., Granite City Steel Co., Crucible Steel Co. of America, Bethlehem Steel Co., Pittsburgh Coke & Chemical Co., Woodward Iron Co., United States Steel Co., Interlake Iron Co., Great Lakes Steel Co., Wisconsin Steel Co., Armco Steel Corp., Allied Chemical & Dye Corp., Sloss-Sheffield Steel & Iron Co., Lucerne Coke Co., Alabama By-Products Co., Tennessee Coal, Iron & Railroad Co. and Koppers Co. Petroleum coke calcining projects are also under construction by Great Lakes Carbon Co. and R. T. Collier & Co.

Allotments of controlled materials for the construction are based on these allocations to the agency from Defense Production Administration: Steel, 18,496 tons; copper and copper base alloys, 400,000 pounds; aluminum, 70,000 pounds.

Coal Pipe Line Started in Ohio

An experimental pipe line to transport coal has gone into operation at Cadiz, O.

Pittsburgh Consolidation Coal Co. says it will be used commercially if a year of tests indicate such operation is feasible. Should that happen, the line would be extended to the Great Lakes and perhaps other large consuming areas.

The demonstration-size pipe line is now about 8000 feet long but will be extended to 17,000 feet. The system uses a 12¾-inch pipe and moves 7000 to 9000 tons of coal daily. The coal is transported as a "slurry," a mixture of fine sizes of coal and water which can be pumped through the pipe line.

FOR HANDLING HOTSTUFF: This upender is being made ready for shipment to U.S. Steel's Fairless Works now going up near Morrisville, Pa. It will be installed to turn over steel coils coming off the hot strip mill, which is slated to begin operations next year

More Amortization Approved

Certificates of necessity for accelerated tax amortization of 162 new or expanded defense facilities were approved by the Defense Production Administration Nov. 17 to Nov. 23.

Largest certificates included one concerning a $57.2 million investment by Copper Range Co., Onatanogan, Mich., for the expanded production of copper ore. Caterpillar Tractor Co., received seven certificates for the production of military earth-moving equipment in Joliet and Peoria, Ill., representing an aggregate investment of $59,603,126. DPA also o.k.'d 30 applications for the production of aircraft parts, representing a planned investment of $17,433,619.

DPA is giving priority treatment to applications involving production of facilities in this sequence: Machine tools, cutting tools, dies, gages, jigs and fixtures; ores such as copper, lead and zinc; pig iron, sulphur, military end items, basic aluminum.

Freight Cars Are Rolling

Maintaining their high production rate of the previous month, freight car builders delivered 9824 new freight cars in November. That's more than 4000 cars above year-ago levels, but a slight drop from October. Orders for 6752 new freight cars were placed in November, bringing backlog as of Dec. 1 to 129,158.

Electric Power: Short Circuit if Expansion Lags

AMERICA'S electric power utilities hope to increase their generating capacity by about 30 million kilowatts over the next three years—at the rate of 10 million kw annually—predicts James F. Fairman of the Defense Electric Power Administration.

"Present estimates indicate that by the end of 1952," he says, "total power demand will be about 85 million kw. The generating capability, if the whole 1952 program is achieved, will be slightly less than 85 million kw." Because of that situation, he thinks the power supply in 1952 for some areas will be "precarious."

Geography—As a result of the growing aluminum program in the South and Southwest, he believes power difficulties next year will be experienced in those regions. He foresees a repeat in 1952 of 1951 Pacific Northwest power shortages because several projects there are not due to come into service until 1954 and 1955.

In 1952 power needs will increase by about 9½ million kw, the largest gain on record for one year, the administrator points out. Ten million kw of new capacity have been scheduled to meet that increase. He doesn't think the figure can be reached if the material shortages continue that have thus far handicapped the electric power expansion program.

Lagging Behind—In 1950, Mr. Fairman points out, power generating capabilities increased by 5½ million kilowatts, while requirements increased 8 million. During 1951, generating capacity went up 7 million kw but power needs went up 7½ million.

The lagging construction pace of 1951, he believes, will have to be reversed over the next three years or the nation will be in serious power difficulties.

France . . . Ups Production but Coke, Scrap Holds Her Back;

French industry has made much progress in industrial development and improvement in 1951, but her basic problems of coke and scrap still remain to be solved

FRENCH INDUSTRIAL development and improvement has progressed according to plan in 1951, and, superficially at least, France is enjoying a war-born prosperity. Her basic problems of coke and scrap supply remain unsolved, though, and it is to them that more attention will have to be given in 1952.

The Korean war produced some beneficial effects on the French economy by creating a high demand for French products, both internally and for export. With other European countries looking to the same sources of raw material supply, however, France is forced to pay a high price to meet this demand. She must either pay premium prices or reduce production as in the case of pig iron.

Bottleneck in Coke — Considering the French iron and steel industry as a whole, the capacity of production of pig iron is estimated at 12.1 million tons yearly; this would require 12,430,000 tons of coke. Owing to the shortage of furnace coke, the possibility of production is reduced by 13.5 per cent.

Only 40 per cent of the coke requirements can be supplied by the French coal mines. Thanks to a new process, more French coal is now turned into metallurgical coke, and it is hoped that supplies from the Lorraine coke ovens will be increased from 1.9 million tons in 1951 to 4.4 million tons in 1953. In the meantime, imports from Germany have dwindled considerably and it is necessary to make up the difference from the United States, at a greatly enhanced cost.

So, No Increase in Steel — Due mainly to the shortage of metallurgical coke, the production of raw steel in France to September, 1951, remained at about the 1950 level. There was a sudden increase in October, 1951, though, when the high figure of 853,600 tons was reached for pig iron, and 979,000 tons for steel ingots and castings. In the Saar the highest figure of production was reached in October, also, when 235,400 tons of pig iron and 264,000 tons of raw steel were made.

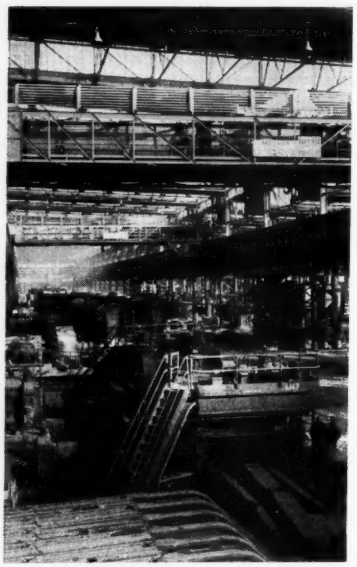
Shortages of scrap has interfered with steel production, too. In order to remedy this, exports of scrap are allowed under license only. Even though permission is granted only in exceptional cases, this block does not suffice to make up for the deficit.

On these pages are two more articles in a series on the economic pasts, presents and futures of the major Western European countries. On Dec. 10 we wrote about Italy and Sweden. Next week, Dec. 24, we discuss Great Britain and Western Germany. A summary of the situation in Western Europe will appear Dec. 31. Complete iron and steel statistics for all industrial nations of the world will be carried in our 1951 Metalworking Yearbook issue, Jan. 7.

Prices Jump Up—Several increases have taken place in iron and steel prices in the French domestic market. The last increase, of 22 per cent, was applied as of Oct. 1, 1951. This brought the rise from January, 1948 up 68 per cent. These increases are illustrated in the table below. The prices quoted do not contain the production tax of 15.1 per cent and the transaction tax of 1 per cent.

	Foundry Pig Iron	Rolled Steel
January 1948	11.410 fr	17.870 fr
January 1949	13.240	20.730
October 1951	19.120	30.070
Per cent increases	67.5	68

Part of the new prices for steel products is earmarked for the technical development of the industry. This amounts to an average of 1300 francs per ton, or 4 per cent of the selling price. The subsidy is considered insufficient, since experience in Europe shows that an investment of 100,000 francs per ton over 20 years, or 5,000 francs per ton per year, is required.



NEW STRIP MILL OF USINOR
. . . French capacity expands

Coal Is Brighter—On the bright side of the picture, coal production increased satisfactorily during the year. Output from January to September, 1951, was 44,634,700 tons, compared with 43,942,800 tons in the same period of 1950. During this period, supplies of coal from the Saar increased from 3,766,400 tons to 4,389,000 tons. Of the 1951 deliveries, 18,260,000 tons went to domestic householders, or 10 per cent more than in 1950. As a result of a very favorable yield of hydroelectric power, the consumption of coal by industry could be reduced.

During 1951, 700,000 kw of electric power were added to existing sources, and it is expected that in 1952 another 1.2 million kw will be made available in hydroelectric stations and 400,000 kw in thermal stations.

Bauxite is the only nonferrous mineral which the French export in any large quantity. Extraction of bauxite, as well as the production of aluminum, have almost doubled since 1949. The average monthly tonnage of bauxite extracted in 1951 was 95,700 tons, of which 16,500 tons were exported. The tonnage of raw aluminum made monthly averaged 9350 tons, and 990 tons per month was refined. One-third of the metal is exported.

Developments—Developments have taken place in all branches of French industry during 1951, and especially among the big three steel combines. The continuous strip mill of USINOR is now in full production, and a similar installation by SOLLAC in Lorraine is being constructed. Several blast furnaces have been modernized. One unit, by SIDELOR, has been blown in and can produce 660 tons per day, with Lorraine ore of 32 per cent iron content. The iron and steel works of Societe Metallurgique de Normandie, at Caen, which were completely destroyed during the war have been reconstructed and almost full operations have been made possible in 1951.

Shipbuilding—As of Sept. 30, 1951, France had regained second place as a shipbuilding country for merchant marine, after Great Britain. At that

Export Trade to Debtors Poses Problem for . . . *Belgium*

Belgium and Luxemburg find that, even while they are enjoying a prosperous economy, there are problems of maintaining trade as a creditor nation

BELGIUM AND LUXEMBURG are embarrassed by riches.

Even though they enjoy one of the most prosperous economies in Europe, the Belux Union found itself faced with an unfavorable trade situation toward the latter part of 1951, caused by its capacity to export abundantly and import moderately. Some countries, in debt to Belux, were unable to place heavy contracts to the same extent as had been done previously.

Also, the Belgian franc devalued only slightly as compared with the pound and the French franc and left the Belgian franc being regarded as a hard, or semi-hard, currency. This has caused a disequilibrium in the balance of payments through the European Payments Union (E.P.U.).

The American Market—A compensating feature in the tightening trade situation has been the substantial volume of exports to the American market. Over 10 per cent of the tonnage of iron and steel products exported were shipped to the United States during the first three quarters of 1951.

The year has been marked by a strong demand from all classes of home steel consumers, some of it unsatisfied because of the proportion of the production which has been exported. Deliveries are extended over several months.

Defense Restrictions — Steel consumption is also affected by the increasing swing of the defense program. A number of restrictions have been imposed on certain civilian goods, especially those requiring nonferrous metals.

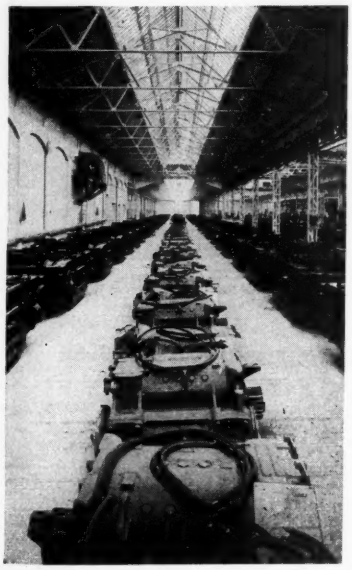
Imports of Belux during the first nine months were slightly below the prewar level, with an index figure of 97.9 in volume. Against this, exports were considerably higher. Exports of iron and steel products reached a record-making 4,290,000 tons in the first three quarters of 1951. Due to price increases, the value of steel product exports about doubled the 1950 figure.

Expanding Production—Though export trade hit some snags, industrial production continued to expand. The general index of industrial production, which was 120.2 in September, 1950, (Base: 1936-38 = 100), reached its maximum in March, 1951, with 131.7 and then averaged 125.8 between April and August. Steel production for 1951 is estimated at 5,575,000 net tons, as compared with 4,164,600 tons in 1950, an increase of one-third.

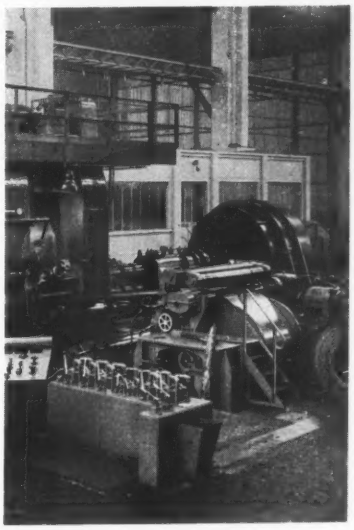
Coal production, on the other hand, has not progressed since the prewar years. As a raw material, however, coal is no serious problem to Belgian industry. But industrial consumption has increased, to the detriment of non-industrial customers. This gave some impetus to imports of coal.

Near Record Year — FABRIMETAL, the organization which constitutes the largest group of steel consumers, has felt the effects of the boom which quickly followed the beginning of the Korean War. The majority of steel consuming industries have thus increased their production; exceptions being the iron and steel foundries, shipbuilders for fluvial navigation, and the constructors of railroad cars. The production of the FABRIMETAL group almost kept up to the high level of 1949, which was a record year.

Since the end of World War II, defective and obsolete machinery has been replaced with new equipment and plant, and an intensive campaign has been carried out to increase productivity. The defense contracts which are now being received by Belgian steel works will give that industry an opportunity to show their ability in mass production methods.



BELGIAN RAILROAD TRUCKS
. . . some will go to Egypt



STRIP MILL OF FERBLATIL
...producing high grade Belgian sheets

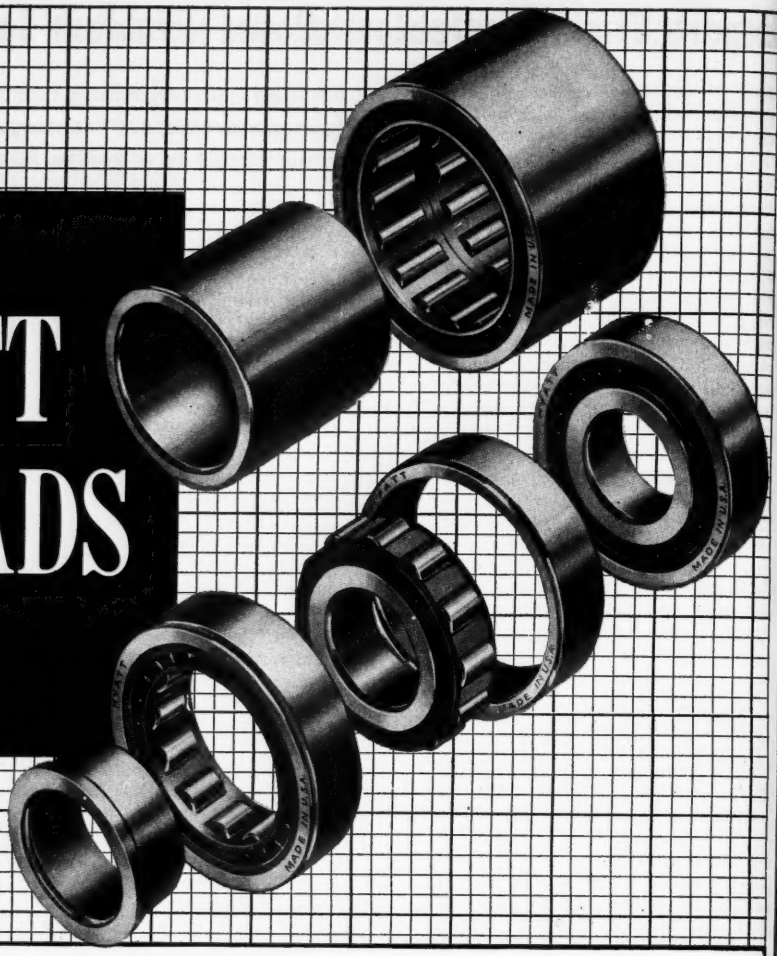
date, French shipyards were building a tonnage in merchant ships of 530,582 tons.

Automotive—French automobile industry as a whole is very active, with some companies working also for the rearmament program. During the first nine months of 1951, French automobile works made 320,861 vehicles, of which 226,087 were for private use and 94,774 were commercials. Exports of all types of vehicles in the first nine months of 1951 totaled 109,076 to foreign markets and totaled 78,200 to French overseas territories.

Tractors — The manufacture of tractors plays the most important part in the French agricultural machinery field. Developing since 1946, the tractor industry now takes fourth place as a metal consuming industry in France. The Societe des Acieries du Nord has undertaken the manufacture of tractors on mass production methods for the public works as well as for agriculture.

Machine Tools—For the first time in the history of the French machine tool industry, an international exhibition of machine tools was held in Paris during September, 1951. The activities of the machine tool industry in France had been rather limited for some time, but they are now on the increase. This is one field in which the French hope to give other European makers some stiff competition.

HYATT HY-LOADS



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There are ten different types of Hyatt Hy-Load Roller Bearings. Four have separable inner races, two have separable outer races, and four are non-separable. There is also the duplex, or double-row type of Hyatt Hy-Load with a separable inner race.

* * *

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HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Ford is girding its loins for an all-out competitive battle with Chevrolet for the No. 1 production position. The climax may come in 1954 or 1955

ONE OF Detroit's larger outdoor signs stands almost directly opposite the imposing General Motors Building on Grand boulevard.

From every north window of that 15-story structure the occupants can read: "Only Ford in the low-price field has both . . . V-8 power . . . and economical Fordomatic drive." Periodically GM people are subjected to such Ford slogans as "You can pay more, but you can't buy better." But all that is infinitesimally small stuff in the competition between Ford and Chevrolet.

Ford Aims High—Ford means to regain its place as the No. 1 auto builder which, productionwise, has been held by Chevrolet every year except one since 1935. The exception was 1945 when neither company made enough cars to talk about. And how it intends to go about seizing the lead is one of the most interesting pieces of scuttlebutt to go around Detroit in many moons.

As the story is told, Ford presently is getting its product, its physical plant, and its personnel in shape to do battle on enormous proportions with the adversary. Completely new styling for 1952 will give it a little edge over Chevrolet's offering, and a new six-cylinder engine will be a strong selling point.

Climax Postponed—But 1952 is not expected to be the year of decision, the story goes. Ford will, as usual, be giving Chevrolet a good run for the money, but neither maker will be functioning in a normal market; both will be able to sell as many cars as they can manufacture. As long as the scarcity of cars continues—and the guessing is that the effective demand level is 5 million cars against a projected 1952 output of about 4 million—the two makers will keep their struggle on something less than an all-out footing.

But one day, it may be in 1954 or 1955, both will get down to a no-holds-barred fight. And here, as the tale-tellers will give it to you, is where Ford has a brass knuckle: It doesn't have to make money. The dividend checks don't have to go out to its stockholders. It can start a price war the likes of which Macys and Gimbels have never seen. The Ford Foundation will come in for a rough siege while its coffers are not being added to, but according to one version of the story, Paul Hoffman is seeing to it that a substantial kitty is built up to get that organization through the dry spell.

For the Long Pull—Ford, however, is said to recognize that it would gain only an interim victory if it wrested sales leadership from Chevrolet by price cutting on a temporary basis. The company's present intense effort at strengthening its entire organization is being made for the long pull.

As an example of Ford's need to do a lot of catching up in physical plant, one man says he understands Ford is able to produce the same tonnage of castings as Chevrolet only by the use of twice as many men. Hence, the feverish Ford activity in all its foundry departments to eliminate the disadvantage.

Proof?—Concrete evidence that lends credibility to the fabric of this yarn are Ford's several recent organizational changes. A significant one was the establishment of a scientific laboratory to engage in basic research. Others are the creation of three new executive offices in its engineering staff and three new departments under these offices, formation of a five-man engineering board for formulating staff policy and programs and the appointment of six new department heads.

As executive engineers heading two of the new engineering offices, Harold T. Youngren, vice president-engineering, named V. Y. Tallberg for administration and R. F. Kohr for general engineering. An executive engineer for passenger vehicles will be named later. Dale Roeder continues as executive engineer, commercial vehicles.

Engineering Changes—The new policy-making engineering board, under Mr. Youngren's direction, will be headed by E. S. MacPherson, chief engineer, engineering staff, and will include the four executive engineers. H. D. Allee, manager, engineering programing department, engineering staff, will serve as secretary.

The three new engineering staff departments created are: Testing laboratories, special vehicles development, and transmission. The first of these has responsibility for dynamometer activities and the body and structures laboratories. The special vehicle development department will be responsible for planning advanced model chassis design. Development of transmission will go to that specialized department.

Heading the six engineering departments are: H. F. Copp, special military vehicles, N. L. Blume, Lincoln-Mercury engineering, H. H. Gilbert, testing laboratory, H. A. Matthias, special vehicle development, H. G. English, transmis-

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,858	746,801
August	571,442	842,335
September	505,758	760,847
October	548,350*	796,010
November	468,000*	833,784
December		671,622

Week Ended	1951	1950
Nov. 17	120,767	122,498
Nov. 24	80,489	122,716
Dec. 1	119,962	152,107
Dec. 8	117,693*	162,757
Dec. 15	115,000*	172,307

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

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sion, and A. M. Wauters, engineering research. H. C. Johnson was named controller for the engineering staff.

Chrysler Gets Unique Device

Chrysler Corp. has a unique new machine which it claims makes its Firepower engine and torque converter the most perfectly balanced unit in the industry.

The electrically driven device consists of a wire-suspended cradle on which each new V-8 engine is placed, and hydraulic drilling and electric welding units, actuated by an electronic circuit. As a new engine comes along the assembly line an electric motor in this twelve-ton $50,000 gadget revs the engine up to 400 rpm, a sufficient speed to show imbalances in the rotating and reciprocating parts—dampener, flywheel, crankshaft, connecting rods and pistons—and torque converter. Those vibrations in the rear half of the engine are magnified and their location and magnitude relayed by the machine's electronic "brain" to the automatic welder which spot welds a corrective metal strip of proper weight at the correct location on the torque converter rim. A drilling machine at the front of the engine gets similar information and removes the necessary amount of metal from the crankshaft damper.

No Hoopla from Chrysler

Realistic approach in telling of 1952 models was made by Chrysler Division's general sales manager, Joseph A. O'Malley, in contrast with the hoopla which most sales, advertising and publicity people have been throwing out at the showings recently. Refinements, rather than revolutionary engineering innovations, characterize Chrysler's line, he said, citing two reasons why the changes are less spectacular than usual: "The demands of the rearmament program created a situation in the machine tool industry that would preclude the extensive tooling program entailed by drastic model changes. Furthermore, Chrysler introduced more important new features in its 1952 line than ever before were offered by any manufacturer in a single year. We believe that our current vehicles are far ahead of the times."

Despite reports prevalent in automotive circles that this year Chrysler would announce a higher horsepower rating for its V-8 engine, the division apparently is satisfied with the 180-horsepower tag. The six-cylinder engine in Windsor models was reworked, its stroke increased from 4½ to 4¾ inches to increase displacement from 250.6 cubic inches to 264.5 cubic inches. It is now rated at 119 horsepower, up three from last year's engine.

This year also widens the availability of Hydraguide power steering, it being offered now on Windsors instead of only on the eight-cylinder jobs.

Change in piston and valve assemblies of the Oriflow shock absorbers, use of chrome-plated top piston rings, and pressurized radiator cap in the sixes, comprise the most important other mechanical changes. Interiors are restyled, and such things as the tail lights and wheel covers were redesigned.

Number of body styles was reduced from 26 to 18 through judicious paring out of those in smallest production. Actually all types of bodies continue available, but not in every model. Thus, the convertible and eight-passenger sedan and limousine were dropped from the Imperial, the New Yorker line no longer has a club coupe, and the club coupe, traveler, and eight-passenger sedan and limousine are no longer produced in the Windsor DeLuxe series.

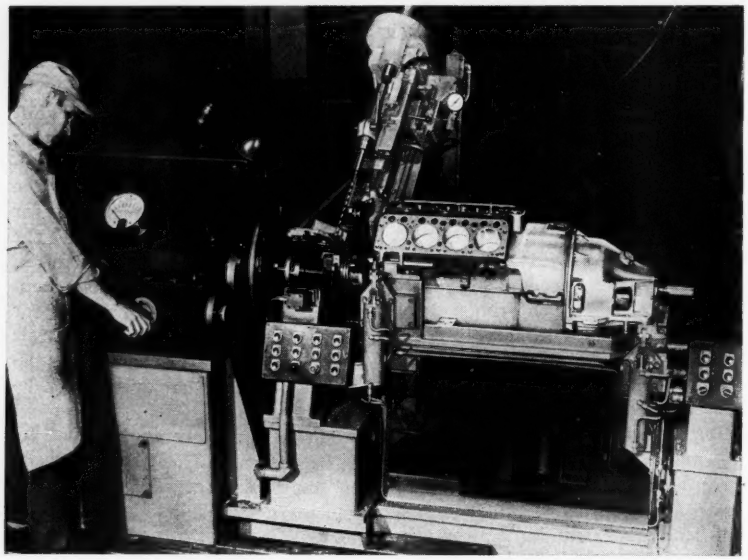
Chevrolet, Olds 'Gun Up'

Two General Motors divisions are getting full steam up under their defense work. Chevrolet last week put on a second shift at its Shell Division plant in St. Louis after receiving a new artillery ammunition contract larger than its first.

Currently employment at the government-owned plant is 1536 and will be increased gradually by 1300. Oldsmobile began production of 90-mm. tank guns in its new plant at Lansing, Mich. About 425 people are presently employed on a one-shift basis. When full production is achieved two shifts will be operated.

Oldsmobile is fabricating the breech ring, breech block and the 15-foot gun tube. Sixty other parts are subcontracted and the extrusion-forged tube itself is supplied by government arsenals.

Getting this gun into production necessitated many makeshift setups. About 20 per cent (or 40) of the necessary machine tools are yet to be delivered. Even without these General Manager J. F. Wolfram says the production rate is accelerating.



CHRYSLER CORP.'S BALANCING "BRAIN"
. . . determines and "tells" location and amount of engine imbalance

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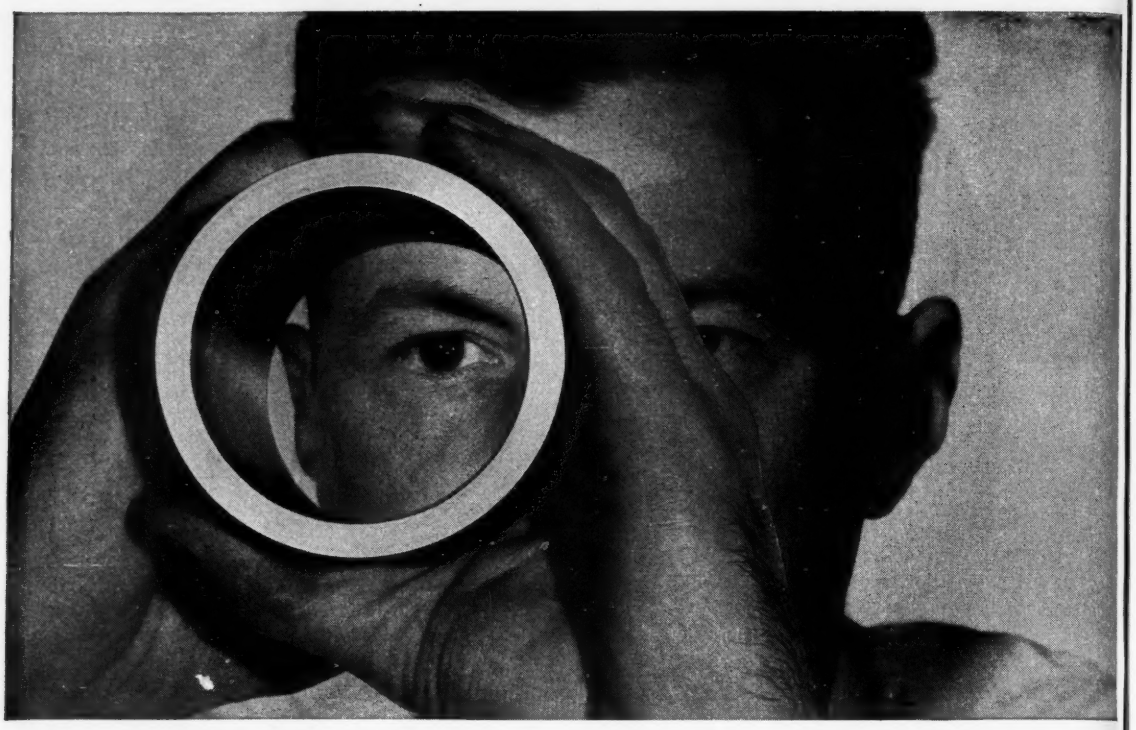

See how to save steel on hollow parts

THE center hole is already there when you use Timken® seamless steel tubing in place of bar stock for hollow cylindrical parts. Finish boring is often your first production step. Since there's less steel to machine away from the inside of the part, there's less scrap loss. You get more parts out of every ton of steel you buy.

To help you save even more steel, The Timken Company offers a tube engineering service which recommends the most economical tube size for your job—guaranteed to clean up.

Use of Timken seamless steel tubing helps make your machine tools more productive. Screw machine stations are released for other operations. You have more machine capacity without additional machines.

Product quality is improved because the piercing process by which Timken tubing is made is basically a forging operation; the tubing has a uniform spiral grain flow for greater strength and a refined grain structure that brings out the best in the quality of the metal. This fine forged quality is uniform from tube to tube and heat to heat, thanks to the Timken Company's rigid quality control.

For further information on the use of Timken seamless tubing, write The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, O. Cable address: "TIMROSCO".

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The Business Trend

Stability marks immediate production scene but weak spots in the boom economy give rise to the question of what will happen after arms spending wanes

AFTER rearmament what will happen to business? That's a question businessmen must answer to figure their long-term prospects accurately —and make plans to fit. The problem arises from stickiness in some sectors of the economy today. Businessmen ask: If there are weak spots in an economy that's shored up by huge outlays for arms, plants and equipment, what will happen after the props are gone?

A number of inflating and deflating factors must be weighed in making long-range decisions. Most important perhaps is that government spending, after reaching a peak in mid-1953, will not drop abruptly. The tapering-off process will continue well into 1954. Even then the rate of total expenditures will be close to $65 billion—about the present annual rate. New industrial capacity coming into operation before 1953 will broaden the base of production potential. Because of the balance between civilian and military production, there won't be a huge reservoir of unsatisfied demand as awaited manufacturers at the end of World War II. Full employment, climbing personal income and booming business for most lines will characterize the period between now and mid-1953. This boom may be the cushion for any business fall at that time.

Stability marks the immediate production scene. Electric power output, setting new records with almost monotonous regularity, sustained STEEL's industrial production index in the week ended Dec. 8. For that period, the index (1936-1939=100) was set at 216.

Pyramid's Base . . .

Basic industry's support to the production index is evident in steel output and shipment figures (see chart, p. 80). More steel was shipped in the first ten months of this year than in any full year prior to 1950—65,918,000 tons. The swift production pace is being maintained in December too. Operations in the week ended Dec. 15 were calculated by American Iron & Steel Institute to yield 2,081,000 net tons of ingots and casting steel, 10,000 tons more than were poured the week before.

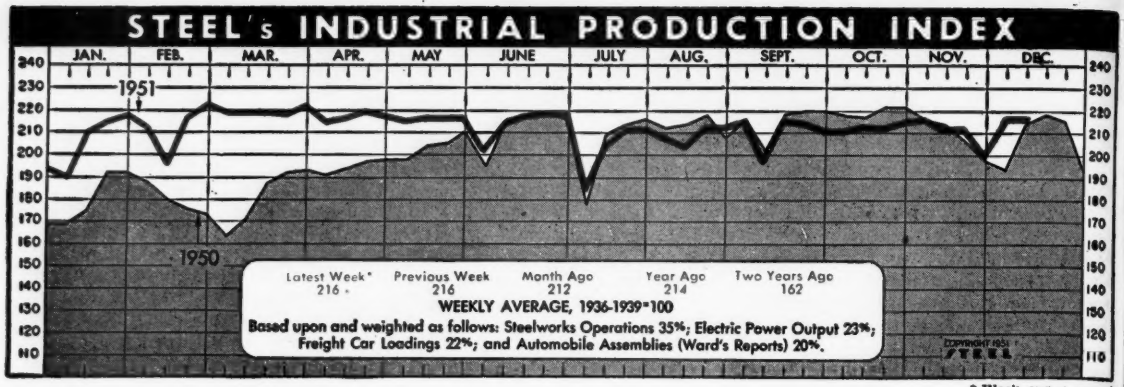
Steady operations at the mills are expected to push payroll of the industry to a new high in 1951. Employment peak for the year of 679,000 was reached in August. Payroll in 1951 is expected to amount to $2.9 billion—$472 million more than the previous record high of 1950. The total would be 85 per cent higher than in 1946.

On the Wane . . .

Model changeovers will hamper auto production for the rest of the year, says *Ward's Automotive Reports*. Over-all production in the week ended Dec. 8 was only slightly under week-before levels at 117,693 cars and trucks from U.S. and Canadian plants. Truck assemblies, continuing strong, have already passed the total production of 1950 and will surely top the record mark of 1,353,000 set in 1948. Canadian plants

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	103.5	103.5	101.5	101.0
	Electric Power Distributed (million killowatt hours)	7,444	7,476	7,396	6,909
	Bituminous Coal Production (daily av.—1000 tons)	2,030	1,682	1,886	1,569
	Petroleum Production (daily av.—1000 bbl)	6,260	6,246	6,203	5,755
	Construction Volume (ENR—Unit $1,000,000)	$324.1	$179.3	$159.5	$484.9
	Automobile and Truck Output (Ward's—number units)	117,693	119,962	117,342	162,795
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	845†	822	791	767
	Business Failures (Dun & Bradstreet, number)	136	148	150	170
	Currency in Circulation (in millions of dollars)‡	$28,891	$28,742	$28,534	$27,698
	Department Store Sales (changes from like wk. a yr. ago)‡	+5%	+11%	+11%	−1%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$17,471	$14,919	$15,182	$17,679
	Federal Gross Debt (billions)	$259.6	$258.3	$257.8	$257.1
	Bond Volume, NYSE (millions)	$16.4	$13.5	$10.5	$25.3
	Stocks Sales, NYSE (thousands of shares)	8,244	6,743	6,041	11,813
	Loans and Investments (billions)†	$73.3	$72.7	$72.6	$69.9
	United States Gov't. Obligations Held (millions)†	$32,082	$31,524	$31,926	$32,984
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	167.67
	STEEL's Nonferrous Metal Price Index‡	234.9	234.9	234.9	242.2
	All Commodities†	177.0	177.7	177.2	173.6
	Metals and Metal Products†	190.9	190.9	190.9	183.5
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 216
Previous Week 216
Month Ago 212
Year Ago 214
Two Years Ago 162
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
Copyright 1951 STEEL

* Week ended Dec. 8

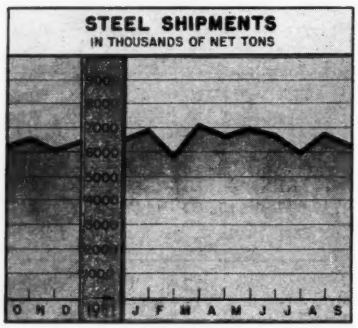
have established an all-time production record this year, despite the poor showing scheduled for December. Over 400,000 cars and trucks have been assembled in Canada so far this year.

Personal Income Jumps . . .

Jump in personal income of almost $5 billion from September to October was reported by Office of Business Economics. The rise—to an annual rate of $257.5 billion was almost entirely traceable to a government pay boost and higher farm income. The remaining components of personal income (nine-tenths of total) showed a rise in the month of only $1 billion at an annual rate. Private industry payrolls stayed at an annual rate of $142 billion. Total wages and salaries in manufacturing, at an annual rate of $58 billion, were a third of a billion dollars lower in October than September, reflecting reduced hours of work and somewhat lower employment in nondurable goods factories. Durable goods industry payrolls continued stable from September to October.

Plant Spending Dips . . .

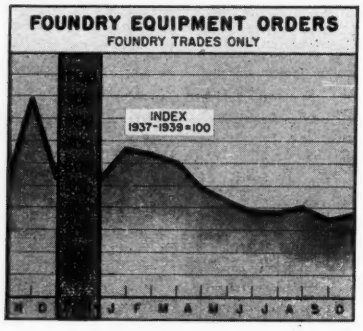
Spending for new construction dropped 7 per cent in November to $2.5 billion, says the government. The decline was mostly seasonal, with all major types of construction sharing in the slide. Public building dropped off more than private because of the fall decline in highway work. Private industrial building and commercial building were both off more than seasonally. Eleven-month figures show that total new construction activity in 1951, valued at $27.7 billion, registered a gain of 8 per cent over the same 1950 period. Industrial plant expenditures over the year almost doubled. Current industrial building, reported by *Engineering News-Record,* led all categories of heavy construction



Steel Shipments
Net Tons

	1951	1950	1949
Jan.	6,904,688	5,482,691	5,788,632
Feb.	5,776,229	5,134,780	5,519,938
Mar.	7,105,078	5,723,340	6,305,681
Apr.	6,634,510	5,780,453	5,596,786
May	6,938,708	6,252,672	5,234,862
June	6,645,897	6,192,438	5,177,259
July	5,988,574	5,668,898	4,534,855
Aug.	6,755,589	6,326,464	4,918,314
Sept.	6,207,491	6,145,354	5,236,196
Oct.	6,844,000	6,503,531	935,037
Nov.	.....	6,051,145	3,296,809
Dec.	.....	6,432,776	5,410,902

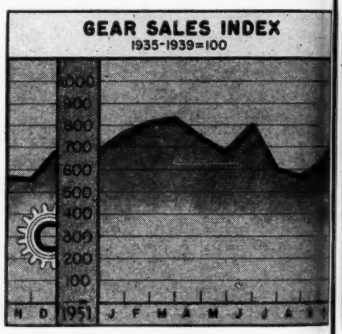
American Iron & Steel Institute



Foundry Equipment

	Index		Value in Thousands	
	1951	1950	1951	1950
Jan.	668.0	159.3	$3,075	$731
Feb.	638.6	113.1	2,940	519
Mar.	599.0	225.2	2,758	1,034
Apr.	490.1	160.6	2,256	737
May	431.7	294.9	1,987	1,353
June	393.2	622.7	1,810	2,858
July	390.3	401.8	1,797	1,844
Aug.	404.5	693.6	1,862	3,183
Sept.	346.5	483.8	1,595	2,220
Oct.	372.4	526.8	1,714	2,417
Nov.	....	885.5	....	4,077
Dec.	....	526.2	....	2,412

Foundry Equipment Mfrs. Assoc.



Gear Sales Index
1935—1939=100

	1951	1950	1949
January	764.6	280.2	320.7
February	809.1	272.9	282.3
March	830.7	358.4	299.1
April	742.5	328.6	339.0
May	667.1	363.1	250.1
June	800.9	401.0	227.8
July	589.1	410.7	193.1
August	564.2	617.4	262.0
September	630.1	654.5	224.9
October	703.4	564.8	242.3
November	....	554.9	230.7
December	....	680.4	242.8

American Gear Mfrs. Association.

Charts—Copyright 1951, Steel

awards for the week ended Dec. 6. A thumping $139.4 million was recorded. For 49 weeks, industrial construction awards top $4 billion.

Job Placements at Peak . . .

Job placements by state employment services are expected to exceed 15 million in 1951, says the Labor Department. Previous postwar high was 13.5 million in 1949. In the first ten months of the year, the 1949 mark was passed as 13,680,400 placements were made. Manufacturing, construction and other nonagricultural workers placed amounted to 5,627,200 of the total. Substantially over last year's figures are job placements of handicapped workers and women. In October (when National Employ the Physically Handicapped Week is observed), 29,452 placements were made, largest number for any month this year.

Business Inventories Climb . . .

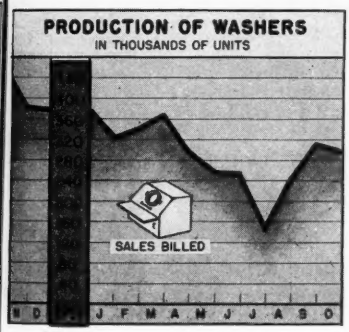
Total business inventories moved up again in October despite a sharp increase in sales. Stocks going into November were valued at $70.4 billion, up $150 million during the month.

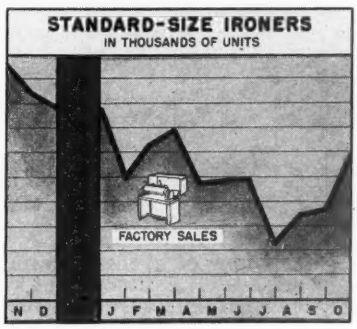
Trends Fore and Aft . . .

Agriculture Department's investment in price support program loans and inventories topped $2 billion at the beginning of November . . . Total demand for oil in 1951 is estimated to be up about 10 per cent over 1950 . . . Wholesale price index dropped from 177.7 to 177.0 (1926=100) in the week ended Dec. 4, but retail food prices are at record highs. . . . Volume of intercity freight tonnage transported by trucks in the third quarter was 1.8 per cent below that moved in the same period of 1950 . . . Airlines are attempting to pare air-coach fares to 3½ cents a mile from the present 4½ cent level. Railroad coach fares vary between 2¾ and 3¾ cents . . . Coal miners dug 12,180,000 tons of bituminous in the week ended Dec. 1—highest output in months . . . Department store sales haven't yet reached the whopping pre-Christmas levels predicted.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Dec.10	Gray Iron Castings.Nov.26	Ranges, Gas Dec.3
Durable Goods Oct.8	Indus. Production ..Nov.19	Ranges, Elec. Nov.26
Employ., Metalwkg.Nov.12	Machine Tools Dec.3	Refrigerators Nov.26
Employ., Steel Dec.10	Malleable Castings.Nov.26	Steel Castings Dec.3
Fab. Struc. Steel...Nov.12	Prices Nov.19	Steel Forgings Nov.26
Freight Cars Nov.19	Pumps Dec.10	Vacuum Cleaners ..Dec.3
Furnaces, Indus. ..Dec.10	Purchasing Power...Oct.8	Wages, Metalwkg. ..Oct.22
Furnaces, W. Air...Nov.19	Radio, TV Dec.10	Water Heaters Dec.3





Household Washers
Sales Billed—Units

	1951	1950	1949
Jan.	321,092	275,576	172,400
Feb.	341,328	342,967	201,300
Mar.	368,455	423,802	242,500
Apr.	292,193	333,072	192,500
May	233,942	304,640	211,700
June	253,119	325,217	260,700
July	139,779	282,261	200,900
Aug.	239,081	381,452	323,789
Sept.	313,756	424,043	357,281
Oct.	297,210	439,924	333,728
Nov.	.....	379,964	298,717
Dec.	.....	377,013	237,591
Totals ...	.....	4,289,931	3,033,106

American Home Laundry Mfrs. Assoc.

Standard Size Ironers
Factory Sales—Units

	1951	1950	1949
Jan.	24,600	20,300	28,300
Feb.	32,400	27,600	28,400
Mar.	34,700	37,800	23,800
Apr.	23,700	31,600	18,100
May	24,200	27,400	19,500
June	24,500	27,100	21,100
July	11,100	25,100	17,700
Aug.	17,200	42,700	32,300
Sept.	18,300	41,400	27,700
Oct.	29,800	47,500	36,045
Nov.	.....	41,900	35,000
Dec.	.....	38,800	19,400
Total ...	.....	409,200	307,345

American Home Laundry Mfrs. Assoc.

Vapor from Paper

STOPS RUST

For Saco-Lowell

Here, messy grease and oil coatings have had their day. Now, in only the time it takes to line a box, textile machine parts are ready to ship or store with no chance of rusting.

Angier VPI* Wrap gives off a vapor that protects for months on end. Because slushing is eliminated, customers are saved the time and trouble of "cleaning".

This vapor method of packaging already has been PROVEN more effective . . . more economical for protecting these products:

( ) Machinery - Industrial, Metal Working, Farm, Office, Construction.
( ) Steel in process of fabrication.
( ) Electrical Machinery, Appliances, Products.
( ) Instruments and clocks.
( ) Fabricated Products—Cutlery, Hardware, etc.
( ) Ordnance Equipment.
( ) Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc.
( ) Others:

Check your product now. Send this with your letterhead to get VPI facts and name of our distributor near you. Angier Corporation, Framingham 8, Mass.

Most Experienced Name in Vapor Rust Preventives

Angier VPI* Wrap

* Vapor Rust Preventive Saco-Lowell Photo

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

get high tonnage because of INTEGRATED PROCESS CONTROL

Select from any of these eleven types of Ohio Steel and Iron Rolls:

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Holl-O-Cast Rolls
Chilled Iron Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Flintuff Rolls
Alloy Chilled Iron Rolls

Every step of the way through production, the quality of your rolls is insured by the group talent of Ohio Steel's PROCESS CONTROL unit. They take over when your order is received. In every phase of manufacture, the same group of metallurgists, chemists, engineers and inspectors follows the progress of your order. They know what has gone before and what remains to be done. Under their direction your rolls are made. And the result is as close to perfection as is possible.

THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

NORTON W. MAILMAN
. . . president, John Chatillon & Sons

JAMES H. W. CONKLIN
. . . sales mgr., Yale & Towne Phila. Div.

J. C. HYDRICK
. . . works mgr., Delta-Star Electric

Norton W. Mailman was elected president, **John Chatillon & Sons Inc.,** New York, producer of scales, carriers, cutlery, precision springs. **Alfred J. Chatillon,** the former president, was elected chairman of the board. Prior to his present association, Mr. Mailman owned and operated Fischer Spring Co., was assistant to the president of Pal Razor Blade Corp., and personnel director of Radio Division, Bendix Aviation Corp. He is currently president of Ardril Realty Corp. and a director and owner of Burrough Bros. Mfg. Co. Inc.

Following purchase by York Engineering & Construction Co., Pittsburgh, of the plant and manufacturing facilities of Gillespie Mfg. Co., that city, the **York-Gillespie Mfg. Co.** was formed to operate the plant and engage in design and manufacture of special custom-built machinery and auxiliary equipment for steel mills and other industrial plants. **Charles MacGregor** was elected president; **James MacGregor,** vice president; **J. Donald Cook,** secretary; and **Philip M. Weber,** treasurer.

Joseph C. Frantz was appointed sales promotion manager, **Apex Electrical Mfg. Co.,** Cleveland. He is succeeded as product sales manager, Holland-Rieger Division, by **Thomas B. Fitzgerald,** formerly assistant sales manager in the division.

E. J. Morgan is now associated with Industrial Division's Chicago office of **J. A. Zurn Mfg. Co.,** Erie, Pa. He has more than 40 years of varied experience as a mechanical engineer, 30 years of which he was associated with DeLaval Steam Turbine Co.

James H. W. Conklin was appointed general sales manager, Philadelphia division, **Yale & Towne Mfg. Co.,** to succeed **James P. Kinney** who is taking over Yale & Towne's distributorship in Los Angeles and southern California. Mr. Conklin for several years had been sales manager of Clark Equipment Co.'s industrial truck division. He goes to Yale & Towne from the sales department of Pangborn Corp., Hagerstown, Md.

R. E. Metzger was appointed assistant to vice president-sales, **Colorado Fuel & Iron Corp.,** Denver. He became associated with CF&I in 1945. Two years later he transferred to the Wickwire Division, on special assignments for the vice president-sales, and in 1948 transferred to California Wire Cloth Corp. as assistant to general manager-sales. **Robert F. Bourne** was appointed assistant to general manager-sales, Claymont Steel Corp., CF&I subsidiary, Claymont, Del. **Harry H. Stracy** was named manager of rolled products sales for the corporation.

William R. Miller was appointed manager of the metallurgical department of **American Steel & Wire Co.,** Cleveland, subsidiary, U. S. Steel. He succeeds **James R. Thompson,** retired after a half-century of service with the wire company.

Brig. Gen. William W. Wanamaker, U. S. Army, ret., was appointed chief engineer of **Orinoco Mining Co.,** New York, subsidiary, U. S. Steel. He will divide his time between the iron ore concessions of Orinoco Mining Co. in eastern Venezuela and the New York offices.

J. C. Hydrick was appointed works manager, **Delta-Star Electric Co.,** division of H. K. Porter Co. Inc., Chicago. He was chief engineer of another Porter subsidiary, Quaker Rubber Corp.

Sheldon G. Klein was appointed general manager, Rice & Adams Equipment Division, **Pressed Steel Car Co. Inc.,** at Buffalo. He succeeds **W. W. Greenway,** named general manager of the company's Chicago Steel Tank Division. Mr. Klein was assistant general manager of Rice & Adams for a short time after serving many years as director of purchases. Appointed to the latter position is **George F. Shea.**

International Resistance Co., Philadelphia, appointed **Charles H. Griffith** general sales manager. He continues as manager, radio sales division.

R. E. Belknap Jr. was appointed manager of the New York district office of **Kaiser Aluminum & Chemical Sales Inc.,** Oakland, Calif. He succeeds **George W. Kurachek** who was transferred to the newly organized development division. Mr. Belknap was in charge of the Boston branch office. **J. J. Reoch** was named assistant New York district manager.

National Automotive Fibres Inc., Detroit, announces that **J. H. Grut,** secretary-treasurer, has been granted a one-year leave of absence due to ill health, and that **Harvey B. Greene,** assistant to the chairman, was appointed acting secretary-treasurer.

Julian Street Jr. was appointed a special assistant of **United States Steel**

Corp.'s New York public relations staff.

Thomas B. Hogan was appointed general superintendent of McKees Rocks,

THOMAS B. HOGAN
. . . supt. of McKay chain mfg. plant

Pa., chain manufacturing plant of **McKay Co.** He has been with the company since 1935.

General Controls Co., Burbank, Calif., appointed **John R. Ferguson** branch manager, Denver district. He succeeds **Herb Lindstrom** who assumes a similar position at the Minneapolis branch.

Robert E. Deshon was appointed assistant to vice president-sales, **Republic Supply Co. of California**, Los Angeles.

Stephen Duda was appointed assistant to director of purchases of **Pittsburgh Steel Co.**, Pittsburgh. **James A. Callahan** was named purchasing agent for the company's Thomas Strip Steel Division at Warren, O. Both have been senior buyers.

J. Robert Simpson III was appointed an associate of **J. R. Simpson & Co.**, Chicago representative for Conoflow Corp., control equipment manufacturer.

Toronto Iron Works Ltd., Toronto, Ont., appointed **G. E. Ellsworth** president and general manager, and **D. A. Y. Colquhoun** as assistant general manager. Mr. Ellsworth formerly was vice president and assistant general manager and replaces **T. F. Rahilly**, who remains a director. Mr. Colquhoun previously was chief engineer.

Roy C. Markle, since January assistant to executive vice president-accounting, **U. S. Steel Co.**, Pittsburgh, has retired. He has more than 50 years of service with U. S. Steel, serving with American Steel & Wire Co., Carnegie-Illinois Steel Corp., and in 1944 was made assistant comptroller of U. S. Steel Corp. of Delaware.

R. L. Bayless was appointed chief, preliminary design, San Diego, Calif., division, **Consolidated Vultee Aircraft Corp.** He succeeds **Frank Davis**, named assistant chief engineer.

Howard J. Stagg was appointed director of training for **Crucible Steel Co. of America.** For the time being he will make his headquarters in Syracuse, N. Y.

Harry M. Hadley was appointed sales manager, **Fageol Heat Machine Co.**, Detroit. He formerly was East Coast sales engineer for Coleman Co. Inc.

Round Associate Chain Cos. elected

WILLIAM J. McELROY
. . . heads Round Associate West Coast group

William J. McElroy as president of the West Coast companies in its group which comprises Seattle Chain & Mfg. Co., Seattle and Portland, Oreg.; Round California Chain Co., San Francisco; and Round Los Angeles Chain Co., Los Angeles. He continues as general manager of Seattle Chain.

David C. Wright was appointed production manager, **Syracuse Alloy Metals Corp.**, Syracuse, N. Y. He was with Tollway Bearing Co. Inc. as methods engineer.

George B. Kellogg and **Theodore M. Dillaway** were promoted to assistant vice presidents of **Buffalo Forge Co.**, Buffalo.

Charles F. Pekor Jr. has returned to **Pekor Iron Works**, Columbus, Ga., as general manager, and **Clyde A. Butler** is back as general superintendent. Mr. Pekor succeeds his brother, **R. Briggs Pekor**, who recently resigned to organize a new business. Mr. Butler invented the "Tell-Tale" centrifugal sand and gravel pump while serving as general superintendent of Pekor before 1939.

Falcon Tool Co., Detroit, appointed **Carl E. Swift** of Los Angeles as its exclusive distributor in southern California to jobbers of its standard line of perishable metal cutting tools, and special tools.

Dearborn Chemical Co., Chicago, has added **William A. Tinsler Jr.** to its sales staff.

R. H. Ringo was appointed resident comptroller of the new General Motors Corp.'s dual purpose plant at Arlington, Tex., **Buick-Oldsmobile-Pontiac Assembly Division.** Also appointed by that division were **J. A. McNamara** as resident comptroller, Linden, N. J., plant, and **H. D. Paustian**, as resident comptroller, Wilmington, Del., plant.

James W. Maughan was named superintendent of **Republic Steel Corp.'s** electric weld tube mills, Youngstown. He was general finishing foreman at the continuous weld tube mills.

J. M. Cochrane returns to his former position as vice president of **Ford Motor Co. of Canada.** He has been serving as director of mechanical transport in the defense production department, Ottawa. **Kenneth O. Grant**, purchasing agent of Ford's steel division, succeeds him in the government position.

Brainard Steel Co., Warren, O., ap-

ALVER E. PETERSON
. . . Brainard Steel controller

pointed **Alver E. Peterson** as controller. For five years prior to association with Brainard, he was with United Board & Carton Corp., Syra-

ROUND AND SHAPED TUBING
.010" to ⅝" O.D. Max.
Certain Analyses .035" max. wall to 1⅜" O.D.
Available in:
Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095
Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100
Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5
Nickel Alloys:
Nickel, "D Nickel"*, "I Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.
Beryllium Copper.
*Reg. U. S. Trademark International Nickel Co.
THE HOLE STORY
by Superior

Chapter 3

The Kink That Takes the Kinks Out of Tubing

In the machine above, a length of tubing is shooting through a row of teeth. It will emerge straight as an arrow—ready for any tough job tubing can do.

Why all this fuss? Because whether our customers use Superior tubing as tubing or thread it, flare it, bend it, flatten it, they want to start with a straight piece to avoid misalignment or poor machining at any stage of operation.

In short, when a customer gets small tubing from us he expects tubing that is mechanically perfect as well as dimensionally precise and metallurgically sound. And he gets it.

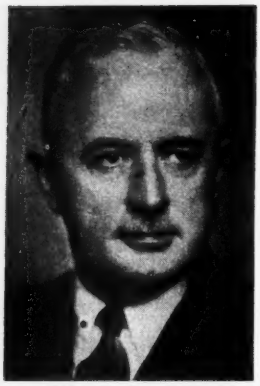
We have many ways of insuring adherence to superior standards in all three. Frequent sampling for chemical analysis and microscopic examination checks metallurgy. Close visual and instrumental inspection at every stage of handling insure dimensional precision and mechanical perfection.

Because of Defense Orders, shortages of metals and other conditions beyond our control, we may not be able to supply all of your requirements for fine, small tubing but it will pay you to specify Superior. Your distributor may be able to fill your order out of stock.

Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

Superior
THE BIG NAME IN SMALL TUBING
All analyses .010" to ⅝" O.D.
Certain analyses (.035" max. wall)
Up to 1⅜" O.D.



C. P. MILNE
. . . Massey-Harris exec. V. P.

D. E. REICHELDERFER
. . . controller of Armco

DON S. SMITH
. . . Wellman Bronze & Aluminum V. P.

cuse, N. Y., as secretary and treasurer.

Massey-Harris Co., Racine, Wis., elected **C. P. Milne** executive vice president. He has been with the company since 1919 in various managerial positions and more recently was vice president in charge of manufacturing. **K. H. Krause**, formerly manager, tank division, was appointed vice president of manufacturing; **L. J. Wolf** as assistant treasurer; **L. W. Petersen** as assistant secretary; and **K. S. Spicer** as special assistant to the president.

George F. Gayer, engineering manager for the Sunnyvale, Calif., plant of **Westinghouse Electric Corp.**, was promoted to assistant manager of the plant.

D. E. Reichelderfer was elected controller of **Armco Steel Corp.**, Middletown, O. He has been assistant controller since 1944, and associated with Armco for 22 years.

H. Arthur Howe, manager of **General Electric Co.'s** chemical division's phenolic products plant at Pittsfield, Mass., was appointed manager of the division's Coshocton, O., plant. **Arthur T. Bourgault**, chemical materials department manufacturing analyst, succeeds Mr. Howe as manager, phenolic products plant. **Jerome T. Coe** was appointed customer service supervisor for silicone products with offices in Waterford, N. Y. **L. Vernon Larsen** becomes engineering section head of Textolite industrial and decorative laminates at Coshocton.

Don S. Smith, general production manager, **Wellman Bronze & Aluminum Co.**, Cleveland, was appointed vice president in charge of production.

Dominion Bridge Co. of Canada, Lachine, Que., appointed **G. P. Wilbur** vice president; **R. S. Eadie** as vice president and manager of the eastern division; and **A. S. Gentles** as vice president and manager of the Pacific division.

Bryon D. Miller was appointed steel industry relations manager for **Toledo Scale Co.**, Toledo, O. He will have headquarters in Cleveland.

William C. Brooks was appointed assistant regional manager of appliance sales for the western region of **Rheem Mfg. Co.**, Milwaukee.

OBITUARIES...

Ralph G. Wiegman, 59, purchasing agent for **Leece-Neville Co.**, Cleveland, and for 35 years associated with that company, died Dec. 10.

Arthur D. Neale, 64, president of **Holden Co. Ltd.** and prominent in Canadian industrial circles for many years, died recently in Montreal. He also was president of Montreal Steel Wheel Co. Ltd. and chairman of Canadian Unitcast Steel.

Dr. Otto C. Schmedeman, 41, vice president of **Reynolds Mining Corp.**, died Dec. 4 of a brain hemorrhage while on a business trip in Mexico City. He became associated with Reynolds Metals Co. in 1941 and later that year was transferred to Little Rock, Ark., as manager of its mining corporation. He became vice president in 1945.

Charles B. Cushwa Sr., 78, president, **Commercial Shearing & Stamping Co.**, Youngstown, which he helped form in 1923, died of a heart attack Dec. 8.

Robert J. Kehl, 62, consulting engineer in the development department of **Linde Air Products Co.**, a division of Union Carbide & Carbon Corp., New York, died Nov. 23.

Charles G. Thornburgh, 62, a vice president of **Rust Engineering Co.**, Pittsburgh, died of a heart attack Dec. 5. He also was a vice president of Rust Process Design Co.

George G. M. McMillen, 87, for 32 years before retirement in 1938 purchasing agent for **Fort Pitt Bridge Co.**, Canonsburg, Pa., died Dec. 3.

Lloyd S. Keeler, operator of **Central Machine & Tool Co.**, Syracuse, N. Y., died Dec. 1.

Alfred D. Morris, 76, president, **A. D. Morris Co.**, Philadelphia, died Dec. 1 after a long illness. He invented a metallic compression ring, and in 1912 founded the company to manufacture it.

William Pohn, 58, treasurer, **Pohn Iron & Steel Co.**, Chicago, died Dec. 1. Mr. Pohn served as president of the Chicago Chapter of the Institute of Iron & Steel, relinquishing the post in 1950.

George C. Davis, 57, Chicago district manager, **North American Mfg. Co.**, died Nov. 29.

H. Arthur Champion, 54, secretary, **Wagner Iron Works**, Milwaukee, died of a heart attack Dec. 2.

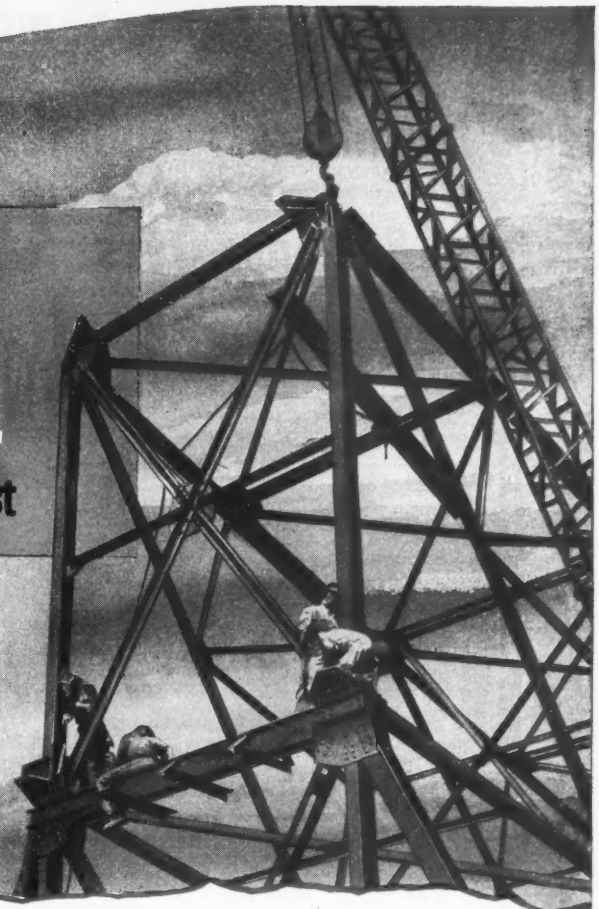
Edwin D. Cook, 82, one of the founders of **Salisbury Wheel & Axle Co.**, Jamestown, N. Y., died Dec. 3 after a long illness.

John F. Segelcke, sales manager, organic acids and plasticizers department, **American Cyanamid Co.'s** industrial chemicals department, died Dec. 1 at his home in Teaneck, N. J.

accurate fabrication

saved erecting time and cost

In just a few words, the Jeffrey Manufacturing Co. expressed what so many Levinson customers have discovered . . . Levinson's accurate fabrication saves time on the job and cuts erecting costs to the minimum.



Thanks very much for your splendid work on this job. It helps considerably in making and retaining satisfied customers. The project engineer told us it was one of the easiest structural jobs ever erected in the field.

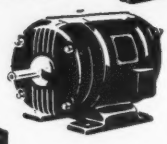
(Signed) L. E. Bixby, Mgr. Contract Dept.
The Jeffrey Mfg. Co., Columbus, O.

This Jeffrey belt conveyor stacker unit was installed at Brewster, Fla., plant of American Cyanamid Co., for handling phosphate rock. Capacity six to eight hundred tons per hour. Stacker is pivoted and travels in a 100-ft. radius for unloading and storage at any point. Another Jeffrey belt conveyor feeds material to stacker.

The Levinson STEEL COMPANY
20TH & WHARTON STS., PITTSBURGH 3, PA.

An ever-increasing number of manufacturers of • Jet aircraft engines

• Electric motors & generators



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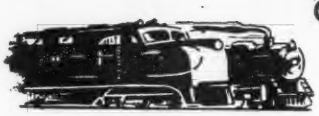
• Railroad products



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110 DIETZ ROAD

Production AND Engineering NEWS AT A GLANCE

JETS-ON-THE-HALF-SHELL—Lockheed is about to introduce a new mass production technique in assembling fuselages for jet planes. Under a simplified system, planes will be put together as two half-shell panels, riveted at top and bottom, instead of using tubular sections. The assembly takes place before wings are attached. The new technique will cut an estimated 40.5 manhours work off each plane and will permit more planes to be built in less factory space. Fuselage interiors will be more accessible. On Jan. 2, the company will throw the switch on new electric-powered assembly lines, counterparts of Detroit's automobile lines. Specific savings from the new system: 46 per cent fewer manufacturing aid hours; fewer assemblies in process, by making planes in larger pieces; 23 per cent saving in working space; 4 per cent reduction in major tooling time; less congestion and less subassembly handling.

AUTOMATIC CIRCUIT PRINTER—Two semi-automatic machines for printing electronic circuits, one for flat surfaces and the other for cylindrical surfaces, were recently developed by the Bureau of Standards. The units are faster than hand printers and give a more uniform product. On flat plates usual production is 1000 plates per hour. Equipped with an automatic feed mechanism and electric drive, the cylindrical-surface unit can produce 500 to 1000 cylinders per hour. In the flat-plate printer, ceramic plates are placed manually in the loading position, moved to the rear of the machine where silver circuit patterns are impressed on them, carried to the unloading position and then flipped into the discharge chute. Three plates are processed simultaneously.

TITANIUM BORROWS FROM STAINLESS—Methods used to form stainless steel sheet are being applied successfully to titanium. Investigations reveal that machines and procedures can be adapted to titanium without extensive retooling. Closer tolerances are usually required for titanium parts than for stainless because excessive "springiness" makes mating more difficult. In the fashioning of some intricate shapes both alternate cold forming and annealing and hot forming have been tried with good results. p. 94

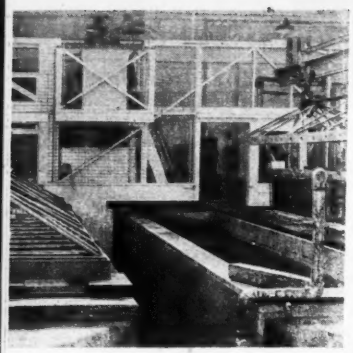
ON FUELS AND POWER—Annual fuel consumption in the U.S. is about one billion tons based on a Btu/ton bituminous coal equivalent, according to Penn State College's Mineral Industries School. Only 30 per cent of the electrical load, still increasing, is generated by hydro plants; the balance comes from fuel-burning steam plants. Distribution of electrical energy increased from 60 billion kwh in 1925 to 270 billion kwh in 1950. A 500 billion kwh load is predicted for 1960. World energy supply: Coal 57.4 per cent, petroleum 23.8, natural gas 6.5, fuel wood 6.4, water power 5.9. If atomic energy ever becomes a universal basic source of artificial energy, it will require tremendous amounts of fuel for its production.

THIN-SKINNED BUT TOUGH—Thin magnesium skins bonded by metal adhesives to reinforcing members of B-36 bombers are giving the big ships more fatigue resistance and smoother exterior surfaces. Used on a production basis, Consolidated Vultee's so-called Metlbond process may portend radical changes in some types of aircraft structures. Such structures may show a marked decrease in the number of component parts required. Lower cost production of airframes with high-production assembly methods and longer service life with less maintenance expense may be in the offing, as a result of the process' application. Extension of the process to ferrous and other nonferrous metals is under study. p. 90

FEWER CARBIDE TROUBLES—Crumbling edges of carbide tools used in cutting steel can be eliminated by honing the tool's edges. According to findings at Frankford Arsenal, all you do is use a 320-grit silicon carbide stone to chamfer all cutting edges 0.002-inch minimum to 0.005-inch maximum to 45-degree angles using a reciprocating hand motion. If the tool has a chip breaker, hone the back edge as well. Chamfer honing should be attempted only by experienced carbide grinders or by carbide application men. p. 106

CHEMICAL SHOW NOTES—Dual improvement in metal cladding techniques was revealed at the recent chemical show in New York. In the first instance, lead is bonded to steel by a new method, making a product called Ferrolum. In the second process, lead and copper are bonded to produce Cupralum. In both cases, acid-resisting qualities of structurally-weak lead are united with strength of steel or the electrical and heat-conducting properties of copper to produce longer-lasting tanks and piping by controlled production methods . . . A method of machine-welding lead to steel is significant because of the difference in melting point of the two metals. The machine follows a joint in the lead lining of a tank, or welds the two metals in bands paralleling the seam. Equipment consists of a traveling flame director which precisely imitates movement of the torch in the hand of a skilled lead-burner. This rhythmic dip, wipe and lift movement of the flame, as well as traverse of the machine is effected mechanically. Several machines can be used gangwise where a large surface is to be cladded.

Metalworking Outlook—p. 53 *Market Outlook—p. 147*



METAL BONDING

• • • Makes Strong, Smooth As

Part of the tank battery used in the anodic treatment for both aluminum and magnesium. Side pulpit control and operator are in background

STIFFENERS are fastened to the skin over more than one-fourth the exterior area of the B-36 bomber with the Metlbond process by Consolidated Vultee Aircraft Corp., San Diego, Calif. The process, for which the company has a patent application on file, is believed to be the only such application used currently in American airplane production.

Under study are extensions of its application to ferrous and additional nonferrous metals, particularly unclad aluminum alloy, steel, thermosetting plastics, wood and rubber. Present B-36 applications are confined largely to thin magnesium skins in the 0.020—0.40-inch range which represent about 90 per cent of use.

Future applications may well involve joining primary structural members such as tension shear webs of beams to be attached to stiffeners and cord members. Particular interest in the fabrication of integral fuel tanks is here involved, since the process would permit a reduction in number of through rivets and bolts.

Smooth and Strong—Attachment of thin magnesium skins to doublers and reinforcing members by the process avoids attachment blemish and gives a smooth exterior surface on locations like trailing edges. It eliminates rivet patterns outside of attachment areas and provides excellent resistance to fatigue in areas subject to vibration.

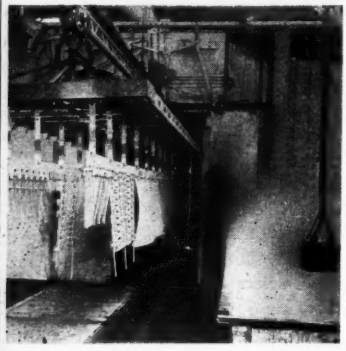
The process has an advantage over most of the other high strength metal adhesives, company engineers state, in that it is more adaptable to production use. Cleaning methods are not unduly critical, since ordinary solvent cleaners are satisfactory. Application in dry film form leads to simplification and avoids numerous troublesome variables which occur when adhesives are applied by brushing or spraying. Curing temperatures are relatively simple to maintain within tolerance limitations permitted. One big advantage is that bonds can be made at pressures below atmospheric. This permits the tooling simplification which results from employing atmospheric pressure by applying a partial vacuum under rubber blankets.

Practical Method—Most practical production method of cleaning consists of the use of solvents. After removal of dyes and paints used for identification purposes with solvents, clad aluminum alloy parts are cleaned in a vapor degreaser using stabilized trichlorethylene. The only additional cleaning required is to wipe faying surfaces with clean, starch-free cheesecloth to remove finger prints and other soil immediately before application of the adhesive. Dampening this cloth with a solvent, such as a mixture of 60 per cent toluene and 40 per cent cyclohexanone, improves results.

Magnesium alloy parts to be bonded are Manodized (a Convair patented anodic process), followed by a thin dip coat of zinc chromate primer. Chemically treated magnesium surfaces can also be primed and bonded, but methods of control to obtain the proper thickness of primer to give adequate corrosion protection without being too thick for best quality bonds have not been worked out in detail. No further cleaning is required except that finger prints and other soil are removed immediately prior to spraying with cement by wiping all faying surfaces with cheesecloth dampened with low flash naphtha.

Use Some, Skip Some—Anodic treatment for both aluminum and magnesium occurs in the same battery of tanks, certain of the baths being eliminated in the magnesium manodizing sequence. After degreasing and cleaning, parts to be anodized are racked conventionally, using magnesium alloy clamps. The load bar is magnesium. Anodizing baskets are accommodated by a 1500 pound capacity crane and controlled from a side pulpit. The travel will soon be conveyorized.

Work load is inserted in the electrolytic cleaning



Typical load of magnesium parts enters dryer after passing through the anodic tank sequence

Smooth exteriors and excellent resistance to fatigue are among advantages of Convair's process now being used on 25 per cent of the B-36's outside area. Other applications to expand use of metal bonding are being developed

By GERALD ELDRIDGE STEDMAN

...th Assemblies

tank. All parts are 1-inch below electrolyte surface and load acts as cathode. Alkaline electro cleaner in formula of sodium hydroxide 10-14 ounces per gallon and Nacconol NR 0.1 ounce per gallon is used and a 2000-amp maximum current is passed through the parts for 3 to 5 minutes. This is followed by a warm water rinse at 140°-160° F for 2 minutes minimum. Magnesium parts omit this step.

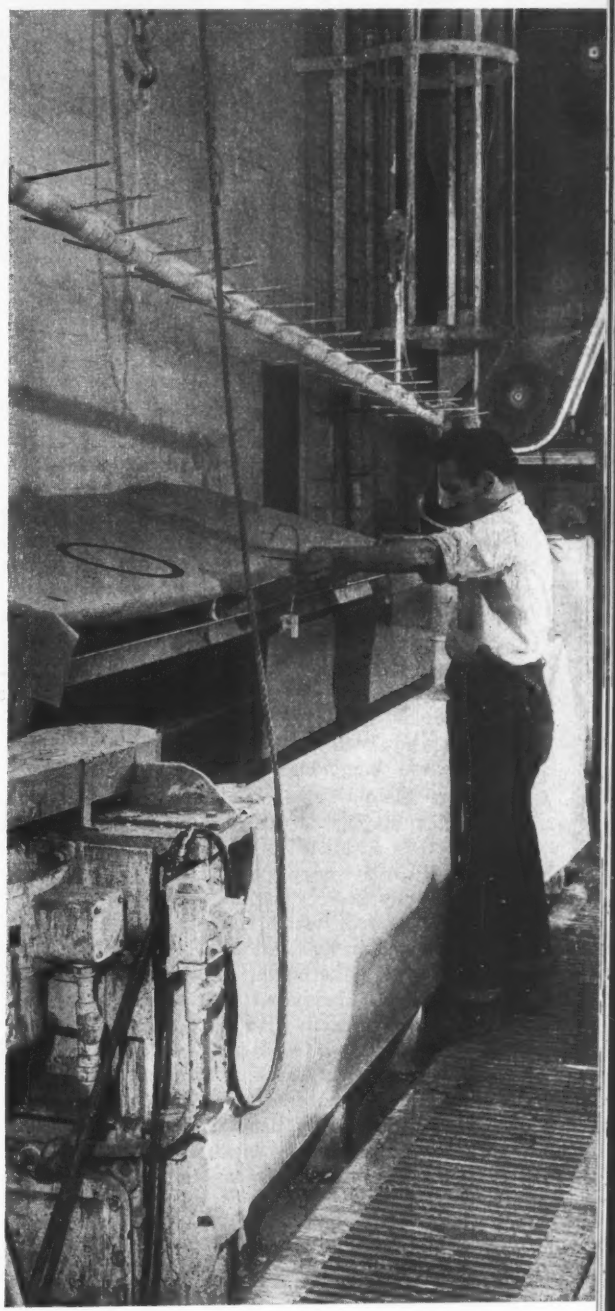
Next comes the nitric-sulphuric pickle at room temperature of 60°-90° F for 4 to 10 seconds, using a formula of 2 per cent sulphuric and 3 per cent nitric acid by weight. Separate tanks are used for aluminum and magnesium anodizing and rinsing but procedures are identical.

Rinsing Important — Both aluminum and magnesium, after the anodic bath, receive a 140°-160° F warm water rinse for 2 minutes minimum, then a hot water rinse at 180°-200° F for 5 to 10 minutes. This rinse is important in providing proper paint adhesion and especially to prevent failure of bond joints on parts to be metal bonded. Maximum alkalinity of rinse water does not exceed pH10. Assembled parts having lap joints are held in hot water rinse at least 10 minutes. Lap joints are rinsed, using air and water gun.

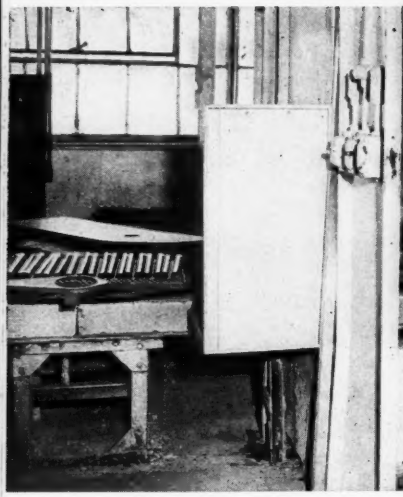
Work then moves to neutralizer tank for brightening, all caustic traces being removed. The neutralizer is chromic acid of pH2-2.3 solution. The parts are then removed from rack and hot air dried at 500° F maximum. On parts to be metal bonded, any anodic powder residual is removed by wiping the surface with a lint and starch free cloth.

Metal bonding requires a dip prime within 2 hours after anodizing. Parts left overnight must again be rinsed, neutralized and dried. Parts must be handled with clean cotton gloves.

Ingredients for Bonding—Metlbond cements consist of two adhesives, M3C and N2. The flexible metal adhesive, M3C, establishes the bond to the metal surface. The low pressure adhesive, N2, which is thermoplastic prior to cure, equalizes pressures by filling small irregularities resulting from imperfectly machined parts or imperfect tools. The combination of these two adhesives in separate layers produces a bond with good shear strength and flexibility. It is as a result of this combination of adhesives that low bonding pressures can be used. These adhesives can



Magnesium alloy parts are given a zinc chromate dip prime coat within two hours, following completion of anodizing treatment



Traveling by continuous belt from turntable at left, magnesium parts are given two spray coats of cement as the first step in the bonding process

Operator applies bonding tape to mating stiffener member in a magnesium alloy assembly prior to curing. Cotton gloves prevent contaminating surface

be purchased under the trade names M3C and N2 from Narmco Inc., Costa Mesa, Calif., or under the names Sila-bond A and Sila-bond B from Pacific Laminates, Costa Mesa.

After the parts are cleaned, two thin coats of M3C cement are applied. At least 5 minutes drying time is allowed between coats. After final coat, the cement is allowed to air dry from 20 minutes to 8 hours. If the 8-hour limit is exceeded, it is necessary to strip to bare metal and reprocess. After the sprayed cement has dried, the stiffening members are placed in a locating fixture provided with pins and blocks for each assembly. A variety of more than 25 such subassemblies has been made accessible to metal bonding and more are being added.

Keep It Tacky—Dry film is then laid smoothly on one of the mating surfaces to be bonded and the other surface assembled in place. When applied, the film is sufficiently tacky to adhere to faying surfaces. It is normally stored in an atmosphere containing some toluene vapor, which keeps it in the most desirable condition for application. However, if it is too dry it may be reactivated satisfactorily by wiping with cheesecloth dampened with toluene. An alternate method of reactivation is to store loose film in toluene vapor for a few hours. It has been found that double film thickness at corners and at other splices does not materially effect strength characteristics. Consequently, delicate fitting at such points is not required. Double thicknesses may be applied at corners, at splices, and sometimes at joggle areas when it is desired to completely fill a small void with adhesive.

Assembled parts are placed in a curing fixture within 72 hours of cement application. Parts must be protected by paper covering from contamination and shop dust while in float before curing. Assemblies are clamped over the entire area to be bonded, the locating fixture being used to apply pressure to the stiffener flanges. The assembly is then covered with a rubber blanket and the spaces under the flat skin and under the blanket are partially evacuated. Tools and assembly blueprints carry the acceptable vacuum limit range.

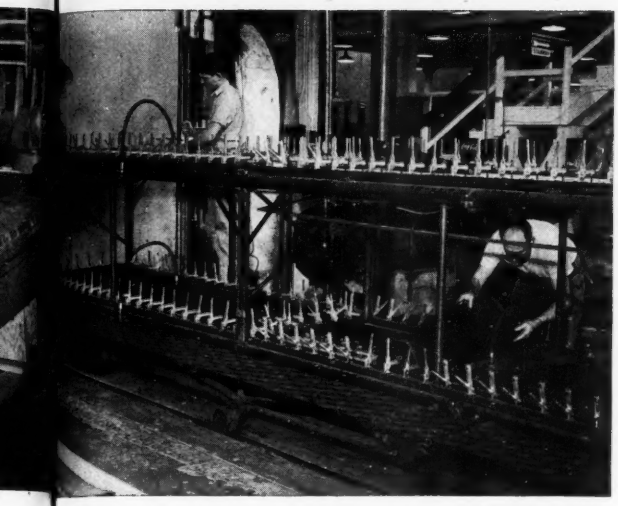
Not Too Exacting—Curing operation is not unduly critical. Complete cure is obtained by subjecting the joint line to a temperature of 320° to 350° F for a period of 25 to 35 minutes. If necessary, additional curing operations do not damage the bond. Care is necessary in handling on removal from the jig because, at the elevated temperatures used, magnesium alloy is susceptible in deformation. Also, since Metlbond joints have lower strength near the curing temperature than at room temperature, bonds can be damaged if assemblies are handled carelessly.

Complete assemblies containing magnesium alloy are next sent to the finish department, where one dip coat of zinc chromate primer is applied. When closed stiffeners are used, large drain holes are provided to permit both the interior and the exterior surfaces to be coated with this primer. This operation is not required for parts containing clad aluminum alloy only.

The cement normally extends beyond the joint sufficiently to form an external bead. If this bead is removed by the trimming of edges at assembly, edges are protected by an additional coat of zinc chromate primer.

Completed parts are next sent to subassembly where they are attached to the structure by conventional means, such as riveting or bolting. Workers have found Metlbonded assemblies easy to install, as they are normally simple in shape and because doublers are always provided at attachment points. Thickness is thus sufficient for a smooth riveting job in final assembly.

Continuous Checking—Several controls have been established to assure the soundness of bonds in production parts. When airplane parts are being fabri-



Assembly being made ready in curing fixture. Lightweight fixtures are used and blanket is evacuated before entry into curing oven

cated, representative samples of cement films currently in use are selected for laboratory shear tests every 24 hours.

Samples of all types of cement film in current use are selected for salt spray test each week. Parts, made in the same manner as daily test coupons, are subjected for 30 days to a salt spray test. If production assemblies containing magnesium alloy are being fabricated, additional panels using Fs-lh magnesium alloy plates, Manodized and dip primed, are also tested. Corrosion resistance of parts joined by the process is found to be remarkably good.

Each assembly is carefully inspected to insure conformance to the requirements of good Metlbonding. This inspection consists of an examination of the flash bead and use of a thin feeler gage to detect unacceptable edge voids.

Sheer Stress Requirements—Film when applied in accordance with the approved specification, must be capable of developing a shear stress of at least 2500 psi in bonds to bare 0.064-inch clad 24S-T aluminum alloy standard panels, with ½-inch overlap. (A typical value is approximately 3000 psi). Ultimate design shear stresses in joints between clad aluminum alloy parts must not exceed 1000 psi. The film must be capable of developing a shear stress of at least 1250 psi, in bonds to primed 0.064-inch AZ31X magnesium alloy standard test panels, with ½-inch overlap. (A typical value is approximately 1600 psi). Ultimate design shear stresses in joints between primed magnesium alloy and clad aluminum alloy parts must not exceed 500 psi.

Convair engineers point out certain design considerations involving thin skinned metal bonded assemblies. When thin metal skin is indicated as a covering material and there is doubt as to its resistance to vibratory loads, the use of doublers and stiffeners attached with the Metlbond process should be considered. However, satisfactory results can be achieved only if good design practice is followed. Since resistance to fatigue results from the avoidance of stress concentrations, doublers of adequate thickness must be provided at all attachment points. Stiffener members should be interrupted only at reinforced points, which may be accomplished by lapping the ends over doublers.

Joggling Not Needed—If stiffeners are of magnesium alloy, no joggling of details is necessary for a perfect fit. The curing temperatures used are good forming temperatures for magnesium. Joggles are automatically provided by the curing tools. Machine countersinking for rivets or screws is permissible in thin sheet which has been built up to the required minimum thickness by the joining of additional sheet with Metlbond.

Detail parts should be kept flat, if possible. Assemblies of any shape which can be manufactured flat, and which are of a size permitted by the dimensions of the surface plate, can be fabricated with the same basic tooling. Skin assemblies for curved surfaces can sometimes be fabricated flat by using stiffeners in the direction of straight line elements.

Economic Facts—Convair technicians have this to say about economies of the metal bonding process in time, money and weight: "Comparative studies of Metlbonding versus riveting of certain assemblies to which either method is applicable have shown an average man-hour saving of 0.43 hours per square foot in favor of bonding. Additional cost of material, however, largely offsets this saving. Thus, relative costs of the two methods must be calculated for each specific assembly. For example, 0.020-inch magnesium for bonding should be compared with 0.032-inch alclad needed for successful riveting. Also, the number of rivets per asembly and the contact area of the bond must be considered in the calculations.

A slight savings of approximately $500 per ship is calculated in favor of Metlbond on the B-36. However, other factors of design and performance far outweigh any direct cost benefits. In general, riveting, welding or spotwelding should not be considered as joining methods competitive with Metlbonding because different design is ordinarily required. It appears, however, that worthwhile savings in cost will be realized when better designs and production methods are developed to take full advantage of the process.

"A direct weight comparison between bonding and riveting cannot be made. Metal adhesive used in joints ordinarily weighs more than heads of rivets used to join a comparable area. Potential weight saving exists when bonding is used because designs can be more efficient."

As the relatively new art of attaching structures with metal adhesives becomes more familiar to designers, advantages will be taken of this technique and changes in some types of aircraft structures may be expected. New applications in types of structure as yet untried will also be proved. Such structures may show a decrease in the number of component parts required. Lower cost production of airframes with high production assembly methods and longer service life are strong possibilities.

STAINLESS FABRICATING

Successfully Form Titanium Sheet

MACHINES and procedures used to form intricate stainless structures can be adapted to shape titanium. In studies completed recently at Ryan Aeronautical Co.'s development laboratories, flat titanium sheet was formed to complex shapes to shroud a high temperature exhaust system which the San Diego company builds for the Piasecki HUP-1 helicopter. This application involves severe forming and resistance welding.

The Ryan Laboratory established an experimental production procedure to determine the behavior of titanium when welded, formed and heat-treated. To check the effectiveness of cold forming plus annealing and hot working of titanium, a number of sheets of 0.018 and 0.37-inch metal were used.

Cold and Hot Forming Tried — A spherical cavity was machined in a steel plate. Diameter of the cavity was ¾-inch and the depth 7/32-inch. By measuring the total deformation possible after forging the titanium into the cavity with a steel ball, using an impact load, it was possible to obtain quantitative evaluation of various annealing and preheat treatments. The results are tabulated in the accompanying table.

These tests indicated that either alternate cold forming and annealing, or hot forming would be feasible. If cold forming and annealing are used, the point at which the part should be removed from the die is critical.

In hot forming, the part was placed in one end of the body half-stamping die, heated to medium red heat and deformed almost to completion. The part was then reheated and deformation completed. No springback occurred. A noticeable amount of lead adhered tightly to the surface which was struck by the lead punch. The part was successfully formed by drawing, heating and hand-working in successive operations. The initial draw was fairly deep and entirely satisfactory.

One-Eighth Inch Springback—An attempt was made to cold form two supports from the 0.037-inch material. The metal was placed in the die and hit several times. Forming was satisfactory except for a springback of about ⅛-inch measured at the ends. Annealing did not alleviate this condition. The thickness loss was found to be from 0.002 to 0.003-inch at the points of maximum deformation.

Scale on the hot formed parts was removed by placing them for 5 minutes in a salt bath descaling tank which consisted of a mixture of sodium hydroxide and sodium nitrate at 850° F. After rinsing, they were dipped for 30 seconds in a cold pickle solution of 46 per cent nitric acid and 8 per cent hydrofluoric acid to remove the titanium dioxide which formed in the salt bath.

Good spotweld results were obtained, in spot welding titanium to itself, with machine settings which produced penetrations from between 70 per cent and 90 per cent.

Shear values were approximately 650 pounds for the 0.018-inch commercially pure titanium and 1300 pounds for 0.037-inch combinations. No success was experienced in spot welding titanium to other metals.

Heated Dies Recommended — From these experimental investigations, Ryan development engineers are convinced that most stainless steel forming techniques can be adapted to the fabrication of titanium parts. The metal should be deformed at temperatures between 800 and 1000° F, preferably closer to the maximum temperature. Although lead dies are not practical, because of the lead pick-up, steel or cast iron dies should prove satisfactory. Heated dies would be desirable and economic for large-run production. Use of a controlled atmosphere furnace would prevent formation of most scale due to heating.

Greatest immediate use for titanium and its alloys will undoubtedly be in the formation of aircraft "skins", or surfaces, for supersonic planes. Friction-induced heat is now zooming temperatures of these high speed aircraft to well above aluminum alloy's limits. Titanium could handle these critical temperatures with ease and buoyancy.

Brittle at High Temperatures—Keenest disappointment which titanium has caused metallurgists, who looked with relish upon its 3150° F melting point and hexagonal crystalline structure, is its inadequacy to withstand continued temperatures above 1000° F. For short periods, titanium behaves beautifully. At exposures to 2000° F flames, aluminum plates disintegrated in less than 1 minute and titanium showed no adverse effects after 30 minutes exposure. Upon cooling to room temperature, it had regained its typical annealed strength.

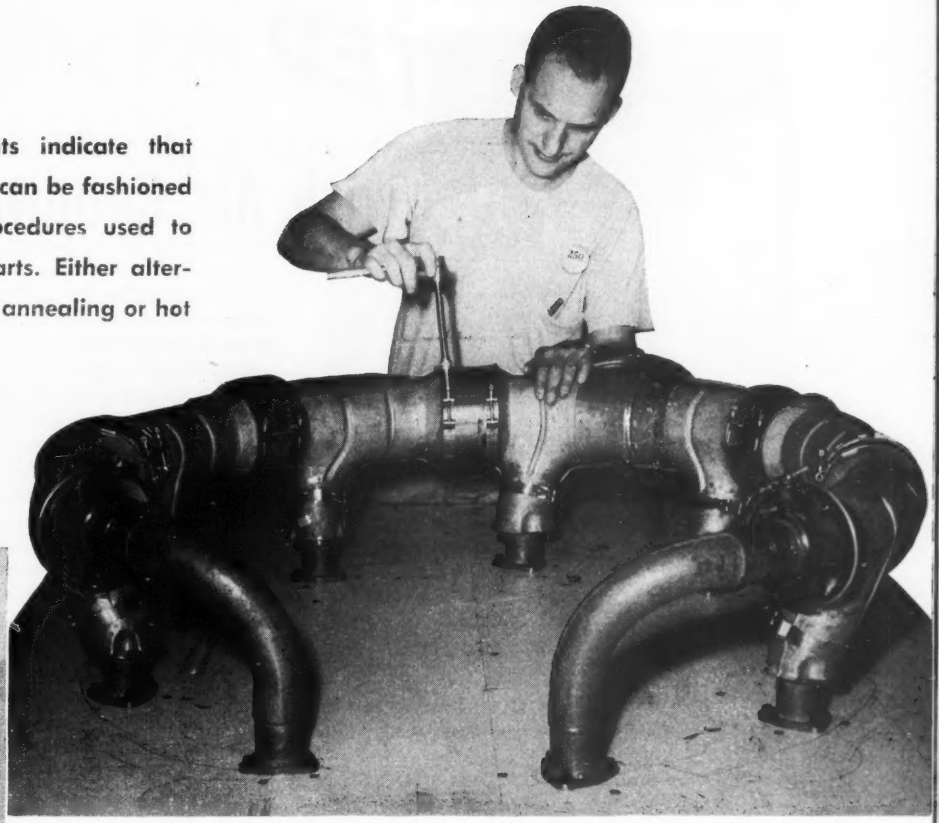
However, under continual temperatures of more than 1000° F titanium suffers an irreversible absorption of oxygen and (*Please turn to page* 110)

RESULTS OF QUANTITATIVE EVALUATION OF VARIOUS ANNEALING AND PRE-HEAT TREATMENTS

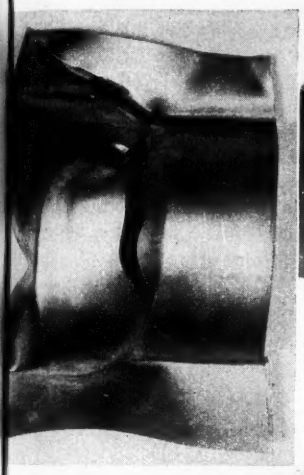
Deforming Temp.	Treatment	Deforming Characteristics
Room	None	Cracked when deformation was about 50% complete
Room	Deformed 50% of possible, annealed 1 hr at 1170° F Deformation then completed.	No cracking
Room	Deformed 50% of possible, annealed 40 min at 1170° F	No cracking
Room	Deformed 50% of possible, annealed 20 min at 1170° F Deformation then completed.	Cracking appeared imminent.
450°F	Previously heated to 1300° F	Cracked when deformation was nearly complete
750°F	None	Cracked when deformation was about 75% complete
1000°F	None	No cracking
1300°F	None	No cracking

METHODS

Laboratory experiments indicate that many complex shapes can be fashioned by machines and procedures used to form stainless steel parts. Either alternate cold forming and annealing or hot forming is feasible

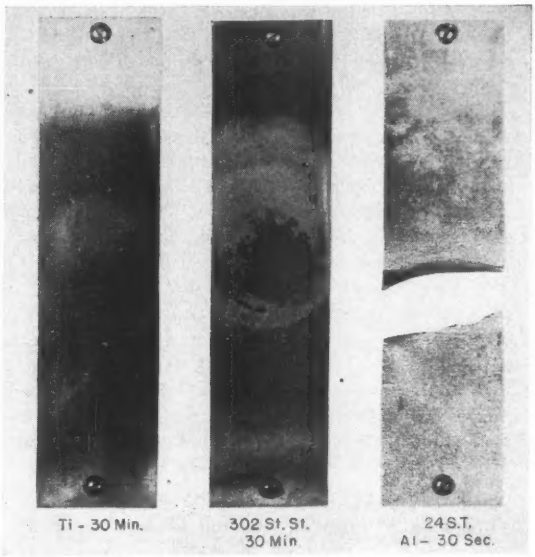


Above—Experimental assembly of shrouded Piasecki helicopter exhaust system. Fit of all stainless and titanium components is checked



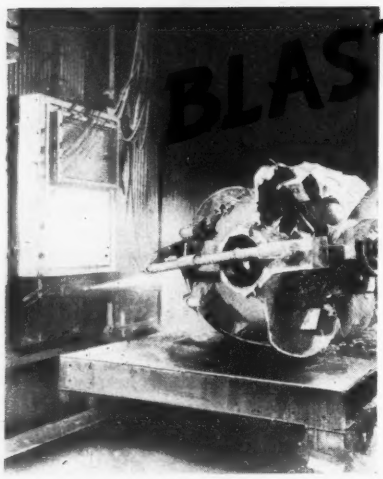
Cracked titanium shroud formed by a procedure involving cold forming and annealing. Crack was caused by difficulties in determining cold-forming limits of the metal in the die

Above—Closeup of part of the exhaust system shrouded section. Note the complex, deep-drawn contours and spot welds



Right—Dramatic evidence of titanium's heat resistance, for limited intervals, is this Rem-Cru Titanium photograph of three test strips of titanium, stainless steel type 302 and Alclad 24ST aluminum. All were exposed to 2000°F flames. Aluminum strip disintegrated in 30 seconds. Titanium showed less effect than stainless after 30 minutes in the fiery blast

Cleaning Costs BLASTED with Air Conditioned Cab



Large castings are placed on workcar and pushed into center of the cleaning room. Operator working in comfort rotates gun to cover all surfaces

SANDBLASTERS at the Falk Corp., Milwaukee, now do their work in an air-conditioned cab within a new Pangborn Hydro-Blast room. The cab moves to any spot on three walls of the room and the operator directs an abrasive stream against the casting being cleaned.

Ability of the abrasive stream to reach any casting surface, the elimination of cumbersome work clothes and increased capacity of the mechanically held hose enable operator to do more than three times as much work as before. In addition, castings are cleaned more thoroughly.

Big Improvement — This setup replaces a conventional hydraulic sandblast system. Under the old method, the operator was dressed from head to foot in rubber clothing. In order to breathe, he pulled along an air hose attached to the helmet of his cleaning suit.

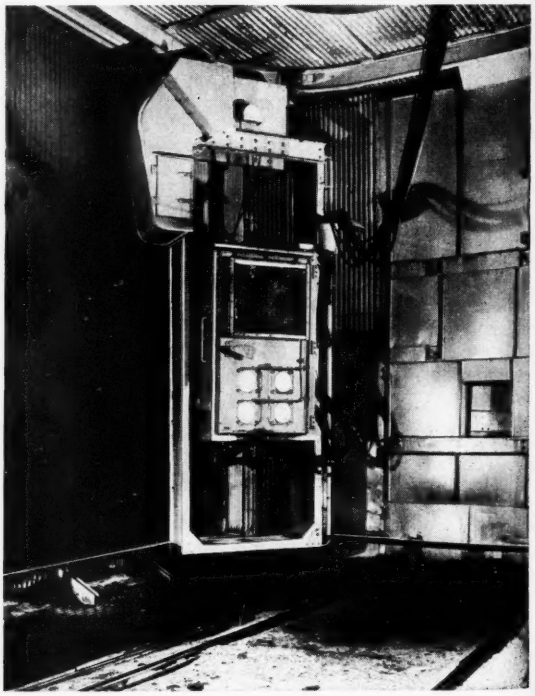
Usable capacity of the high pressure blasting-hoses was limited by the operator's physical strength. The blasting job was so tiring that frequent rest periods were necessary. This method of knocking out cores and cleaning large castings was slow and costly. By eliminating many difficulties in the older method, the new system speeds the cleaning operation, reduces the cost of cleaning and does better work.

Flexible Setup—Main parts of the system are the control car, a cleaning room, and the abrasives reclamation unit. The cab is mounted on a carrier which moves along three sides of the cleaning room on a monorail. It also moves vertically to give the cleaning gun complete coverage of the work. The gun nozzle has a capacity of 60 gallons per minute at 2000 pounds per square inch pressure. Conventional capacity is 30 gpm at 1800 psi.

Turret-like action of the gun allows rotation through 60 degrees horizontally and 50 degrees vertically. By moving the carrier along the wall, the car up and down, and rotating the gun, the operator can direct the abrasive stream from an infinite number of points to cover all the surfaces and crevices of intricate castings.

No Waste—Cleaning room is 23.5 feet long, 21 feet wide and 17 feet high. Castings are placed on a workcar and pushed into the center of the room. Spent sand and water fall to the floor and drain off through a bargate to a reclamation unit.

Falk uses the blast room to clean and decore marine drives, speed reducers, couplings, precision helical and herringbone gears, jobbing castings, housings for turbines and steel castings for mining machinery and crushers. Some of the castings weigh as much as 90,000 pounds.



Ability of the cab to move vertically as well as along three sides of room on monorail allows completed coverage of work

RF Heating Pays Off

in Components Production

RADIO FREQUENCY induction gear hardening of tractor transmission gears at International Harvester Co., Louisville works, yields savings totaling $70,000 per year. Bell & Gossett Co., Morton Grove, Ill., using a smaller 450-kilocycle setup for hardening both sides of the thrust collar of a centrifugal pump shaft reports "considerable savings in overall cost coupled with better quality control and a better quality shaft." These case histories of satisfactory usage of RF induction heating are among those on file at Westinghouse Electric Corp., Pittsburgh, manufacturer of the induction heating apparatus, accessories and related work handling equipment.

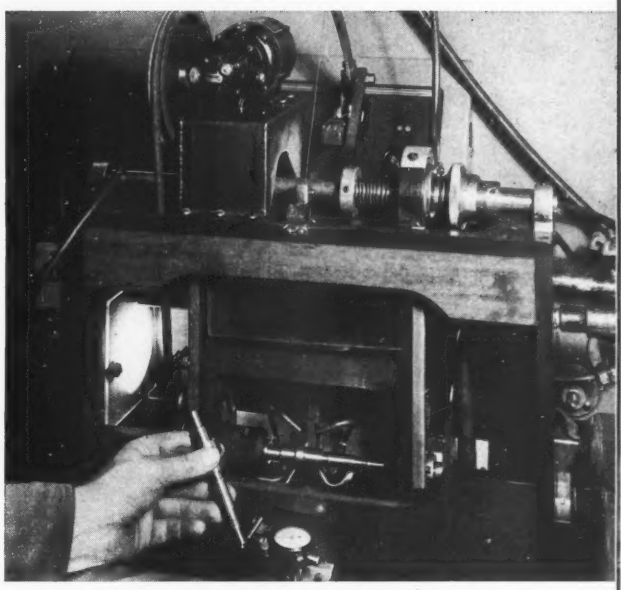
International Harvester has two 150-kw, 10,000-cycle motor generator sets, two 200-kw, 450-kilocycle radio frequency generators, one 50-kw, 540-kilocycle radio frequency generator and associated work handling equipment for processing 26 different parts. The process illustrated is the gear hardening operation, superseding the previously used carburization process. Tractor production totals 503 daily and includes three different types for which all parts including the transmission are manufactured at the Louisville works.

Continuous Treatment—Two gear machines are used alternately. As one is being set up, the other is in production. Production ranges from 500 to 900 gears per hour per machine. The slower rate is on a small cluster gear where the limiting factor is the preheat power available.

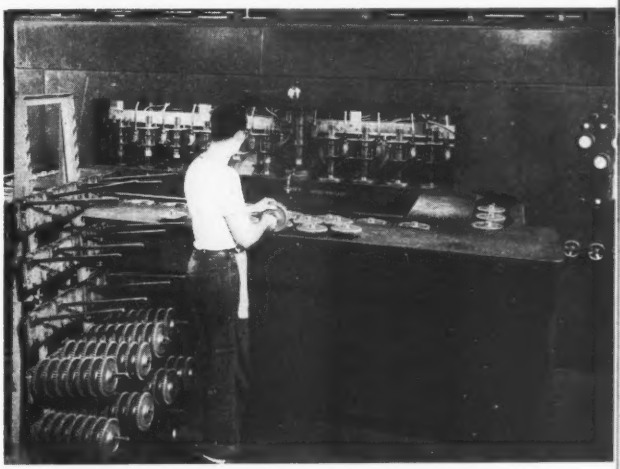
Operator places the untreated or green gear in a tray which is part of an indexing endless conveyor. The gear is indexed to a position over a spindle which raises and rotates it in a 150-kw, 10,000 cycle preheat inductor coil. Following this first preheat the spindle lowers, replaces the gear in the tray and the tray indexes to the second preheat station. The gear is further preheated here and in a third preheat station. It is then indexed to the high power RF contour heating station, heated and indexed to the fifth and final station where it is quenched.

Practically No Loss—The gear heat-treat scrap rate on these machines is between 0.2 and 0.3 per cent. In the gear industry a scrap rate of 1 to 2 per cent or ten times as great as experienced here is considered satisfactory.

In the carburization process formerly used, operations included: Loading pipes and cleaning, grinding the hub faces, demagnetizing, washing and filing the rebroaching burrs. Such operations as grinding the hub face and size broaching the spline are no longer necessary. Also washing and filing the rebroaching



Operator needs only to load and unload Bell & Gossett's RF induction heating setup. Distortion due to hardening is eliminated, inspection costs are lower and savings through product redesign are benefits of the process



Induction contour hardening at International Harvester cut heat treat costs up to 16.2 cents per gear. Output rate ranges from 500 to 900 gears per hour

burrs aren't necessary since these operations are eliminated.

Simple but Effective—Hardening both sides of the thrust collar of a centrifugal pump shaft at Bell & Gossett Co. requires a 20 kw, 450 kilocycle induction heating generator. The shaft made of SAE 1045 steel is heated to a case depth of 40 mils and then quenched to obtain exceptional hardness.

Operation of the equipment requires an operator only to load and unload the work handling mechanism. Job doesn't require skilled help and is done in the following four steps: 1. With the operator's handle in the released position, shaft is placed in the case by the operator who then depresses the shaft release lever. 2. Collar of the shaft is centered in a hairpin inductor coil by adjusting the horizontal position by means of thumb screw. Correct alignment is indicated by a dial position indicator. 3. Operator's handle is pulled forward closing the glass case front, moving the entire case back and placing the collar inside the inductor coil. Then the fully automatic heating and quenching cycle is initiated. This cycle is automatically timed and requires 4 seconds for completion. 4. Operator's handle is released, the shaft is removed with the aid of the shaft release and the mechanism is ready for the next shaft. Output is 155 shafts per hour.

Benefits Galore — Shaft distortion is practically eliminated and the straightening of the hardened shaft, previously required, is now unnecessary. Close control of the hardness pattern, inherently obtainable with induction heating, but not with the previously used method, permitted redesign of the pump shaft with an accompanying reduction in costs. The redesign eliminates a brass sleeve which was previously required in an adjacent area affected by the carburizing-hardening cycle. The company also has been able to replace 100 per cent inspection with statistical quality control.

How to Make Your Own ID Sander

Behr-Manning Corp., Troy, N. Y., announces development of a coated abrasive belt sanding unit for sanding, grinding and polishing of inside diameters. Unit is adaptable to either free running or platen backed belt operations. It has been used successfully on such items as bomb straps, horn rings, gas tank necks, tin snips and heavy shear rings.

Called the tongue sander, the unit is not manufactured or sold by the company, but can be easily assembled using standard parts. Complete assembly data can be obtained by requesting Products Engineering Bulletin No. 10.

Adhesives Book Sticks to Topic

Function of adhesives, coatings and sealers in product design and engineering is featured in an 8-page handbook available from Minnesota Mining & Mfg. Co. Booklet, revised to include 1951 data, reports on 1000 different basic formulas.

Illustrated are 16 different design problems and their solutions: Coatings to protect metal against corrosion and against marring during fabrication; sealers to achieve tight joints despite fuels and flexing; and adhesives to make products both lighter and stronger. Booklet is available by writing to the company at 411 Piquette Ave., Detroit 2.

Heliarc Process Speeds Output

Steel extension legs for converting regular army cots into doubledeckers in a fast operation at Dearborn Stove Co., Chicago. Large demand resulted in an assembly line operation in which four men weld 3600 legs during one 8-hour shift. Operators take the extension legs from feed hoppers and position them in a clamping device that forces the tubing edge together.

Three 1½-inch welds are made in each leg along the 17-inch seam. When welds are completed, the operator drops the leg extension through a chute and onto a conveyor belt that carries them to another part of the shop. The entire operation takes only a half minute or less. No extra metal from welding rod is required and there is a minimum of grinding and after-finishing.

Copper Cladding Process Shown

Inseparable bonding of copper to steel was demonstrated last week at the metallurgical laboratory of James H. Herron Co. in Cleveland by W. L. Ulmer of Automatic Gasflux Co. and Superior Flux & Mfg. Co., Cleveland. The process makes possible the production of sheets with an 80 per cent steel 20 copper composition.

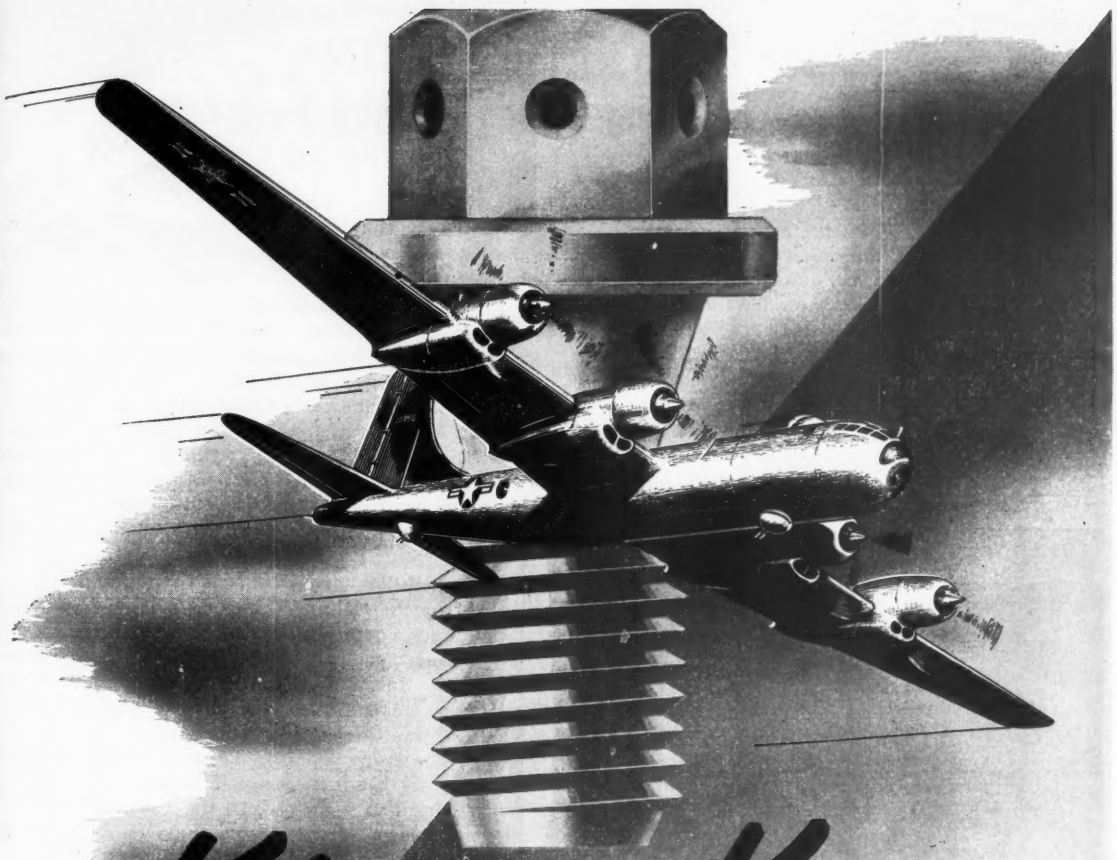
It starts with preheated, pickled steel slabs on which copper or copper alloy is cast. The bimetal slab is reheated to the melting point of the copper, then rolled into commercial sized sheets, plate and strip. Secret of the process, the inventor says, is the use of a highly volatile boron liquid flux called Gasflux that vaporizes when used.

Mr. Ulmer claims the process is simple and economical since it uses steel in the form of slabs and copper in ingot form. He says further that the process is adaptable for use in ordinary steel and brass rolling mills without requiring special, expensive equipment.

The process has gone through the experimental and development stage and is ready for commercial use, Mr. Ulmer says. Bimetal slabs up to 3½ inches thick, carrying approximately 20 per cent copper and 80 per cent steel have been made and successfully hot rolled into sheet bar and commercially sized sheet and strip by several steel companies. Their experience shows that bimetal slabs made according to the Ulmer process can be processed and finished much the same as steel slabs.

Sheets down to 16-gage and 30 inches wide were successfully hot rolled and this metal was then cold rolled down to 0.005-inch in thickness. In the finished sheets there was no separation of bond and the proportion of copper to steel was maintained throughout the rolling.

Western Cartridge Co., East Alton, Ill., fashioned 30-caliber cartridge jackets out of the bimetal which were made up into small arms ammunition. When tested it was found to be satisfactory.



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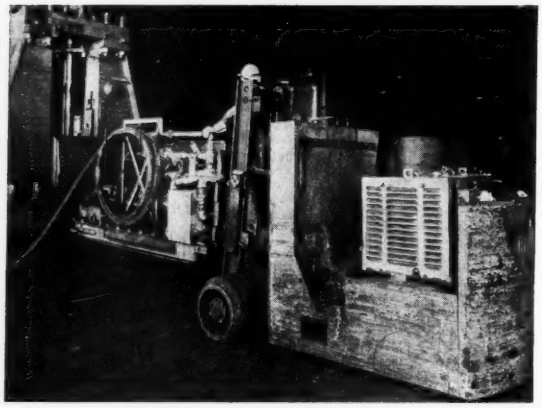
Forge Shop Handling Needs Rugged Equipment

HANDLING equipment in the forge shop of a major automobile manufacturer takes a terrific beating. The shop bangs out heavy crankshafts, connecting rods and other automotive parts for its parent company's assembly plants. Extremely heavy loads, a soot-filled atmosphere, rutted floors and a 24-hour work schedule give industrial trucks and overhead equipment a real workout.

Raw material, in the form of steel billets, comes in to the forge shop on highway trucks and freight cars. It is stored in an outside storage area that



Air-operated key driver mounted on skid used to drive die key. Truck operator does the job, eliminating a hazardous method formerly used. This is truck's only job

runs alongside the forging machinery. When they arrive, these billets are up to 15 feet long. Before they can be used in the huge forging presses, steam hammers, board hammers, upsetters, bending and roll machines, they must be cut down to a workable size. An overhead crane is used to place the steel bars on conveyors which carry them to a shearing machine. This shear cuts through 4 x 5-inch steel billets slicing them into short lengths that are discharged into gon boxes at the rear of the shear and placed on racks.

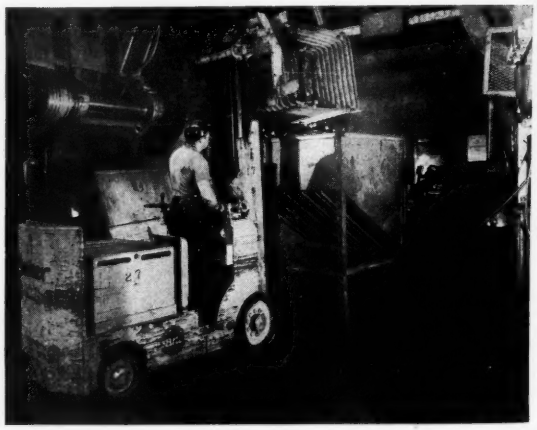
Fork lift trucks pick up the containers of sheared billets and take them to an induction furnace or to other furnaces for heating before forging. These loads may be as heavy as 4 tons, and they must be hauled through tight corners on rough flooring. Electric fork trucks take these difficult conditions in their stride.

Heavy Lifts Are Easy—At some furnaces the billets are lifted by trucks with rotating forks and dumped into hoppers. An employee lifts the billets onto feed units to keep them flowing into the furnace at the proper rate. From the furnaces through the different forging steps that turn a steel billet into a crankshaft, the material is handled by forge shop workers using hoists and tongs.

Finished forgings are fork trucked from the forging area to heat treating furnaces, in which they are put through a heat treating process that hardens them and changes certain physical characteristics in the metal to make them more suitable as automotive parts. After heat treating, the parts go through a cleaning operation—either pickling or shot-blasting —that removes scale and readies them for machining. Fork trucks take loads of finished parts to the inspection tables and following inspection out to the shipping area.

Key Operation—One of the shop's heavy-duty finger trucks has the full-time job of carrying a key driver to drive keys into position. It is used three shifts a day for this job alone. Driving keys requires considerable skill. To do it, the shop formerly used a solid steel ram, about 6 feet long and 1 foot in diameter. The ram was carried in a cable sling by an overhead crane. The crane operator, by maneuvering the ram back and forth, set it in motion enough for a crew of five laborers to guide it into the key and drive the key into place. Mixed signals could mean injury to the men involved.

Now the shop uses an air hammer unit carried on the forks of a 12,000-pound Baker fork truck to drive the die keys. The truck operator drives up to a hammer, raises the forks of his truck so that the ram will be at the right level to squarely smack the die key, gets off the truck and pulls the lever that propels the ram.



Connecting rod billets are readily loaded into a hopper for further processing in an induction furnace. Loads may be as heavy as four tons but are delivered with little effort

BUILDS LIGHTER, STRONGER PRODUCTS

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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BUILDS LIGHTER, STRONGER PRODUCTS AT HALF THE COST

By **Robert F. Christian,**
General Manager, J. D. Christian Engineers
San Francisco, California

ORIGINALLY, our gearmotor housings were made from gray iron. However, during World War II we developed many techniques in welding these gear cases that are saving materials, manpower and shop cost. Among the advantages gained by our conversion to welded steel are the following benefits:

1. Savings in weight alone have proved important to equipment builders who use our products and who must ship their machinery "prepaid" to all parts of the country. The weight savings also allow lightening up supporting structures to save construction costs of our customers' products.

2. Shorter shop schedules are improving our own deliveries by eliminating the demand for core work formerly required on our original designs and which was not attractive to suppliers.

3. With welded construction, our products are more adaptable for use on special machines. For example, the relocating of mounting bolt holes is now easier.

4. Ninety per cent of the machining time formerly required has been eliminated.

Conservatively speaking, our shop turns out comparable equipment for about half of the original cost in gray iron.

Similar savings are undoubtedly possible on many of your present and proposed products. A Lincoln Welding Engineer will gladly work with your designers to show how you can benefit with welded steel. Call or write.

PROPER DESIGN IN WELDED STEEL ALWAYS IMPROVES PRODUCT AND LOWERS COSTS

Fig. 1. Original Construction of gear motor housing. *Required 90% more machining.* Weighed 175% more than welded steel.

Fig. 2. Present Weldesign in Steel. *Costs 50% less.* Further saves shipping costs "prepaid" by manufacturers, using the product.

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Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 613,

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO

DIFFERENTIAL COATING PROCESS • • • Saves Tin

By J. J. MUNNS
Vice President
Weirton Steel Co.
Weirton, W. Va.

Different weight of coating on each side of sheet provides stock for containers with inside surface capable of resisting attack of product and outside surface of withstanding atmospheric conditions

UNITED States has 30 electrolytic tinning lines capable of producing annually 3,500,000 tons of electrolytic tin plate (0.5-pound grade). Two American built lines are in Canada, two in Great Britain, one in Belgium, two lines are planned for France, and one for Australia. In the development of electrolytic tinning by the different producers, two general systems are followed—the alkaline and the acid. Of the 30 electrolytic lines in the United States, 13 are alkaline and 17 are acid. The lines abroad are the latter type. It is a tribute to the resourcefulness of the pioneers in the field of continuous high-speed electrolytic tinning of strip steel that two distinct types were developed to produce the same product.

Electrolytic lines of the Weirton Steel Co. use an acid electrolyte developed by Du Pont, called the Halogen process. These lines are the horizontal type of construction which permits depositing tin on one side of the strip at a time. The plating section has two decks of 12 cells each, or 24 cells total. Each cell can be operated independently—as well as each of the two plating decks.

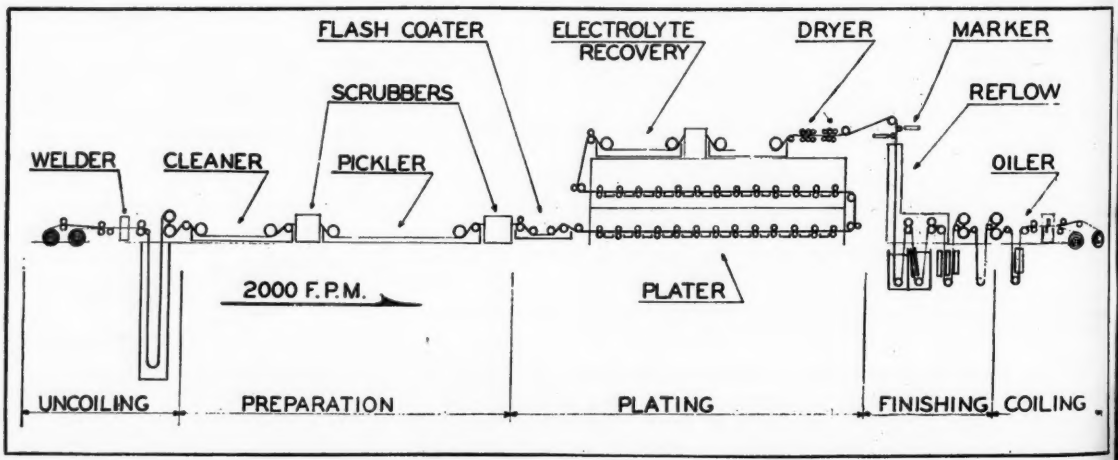
Differential Tin Coatings—The term "differential" is used to designate the application of a different coating weight to each side of the sheet. In other words, it is providing for the container an inside coating of sufficient thickness to resist the attack of the product and an adequate outside coating to withstand the rigors of processing and atmospheric conditions.

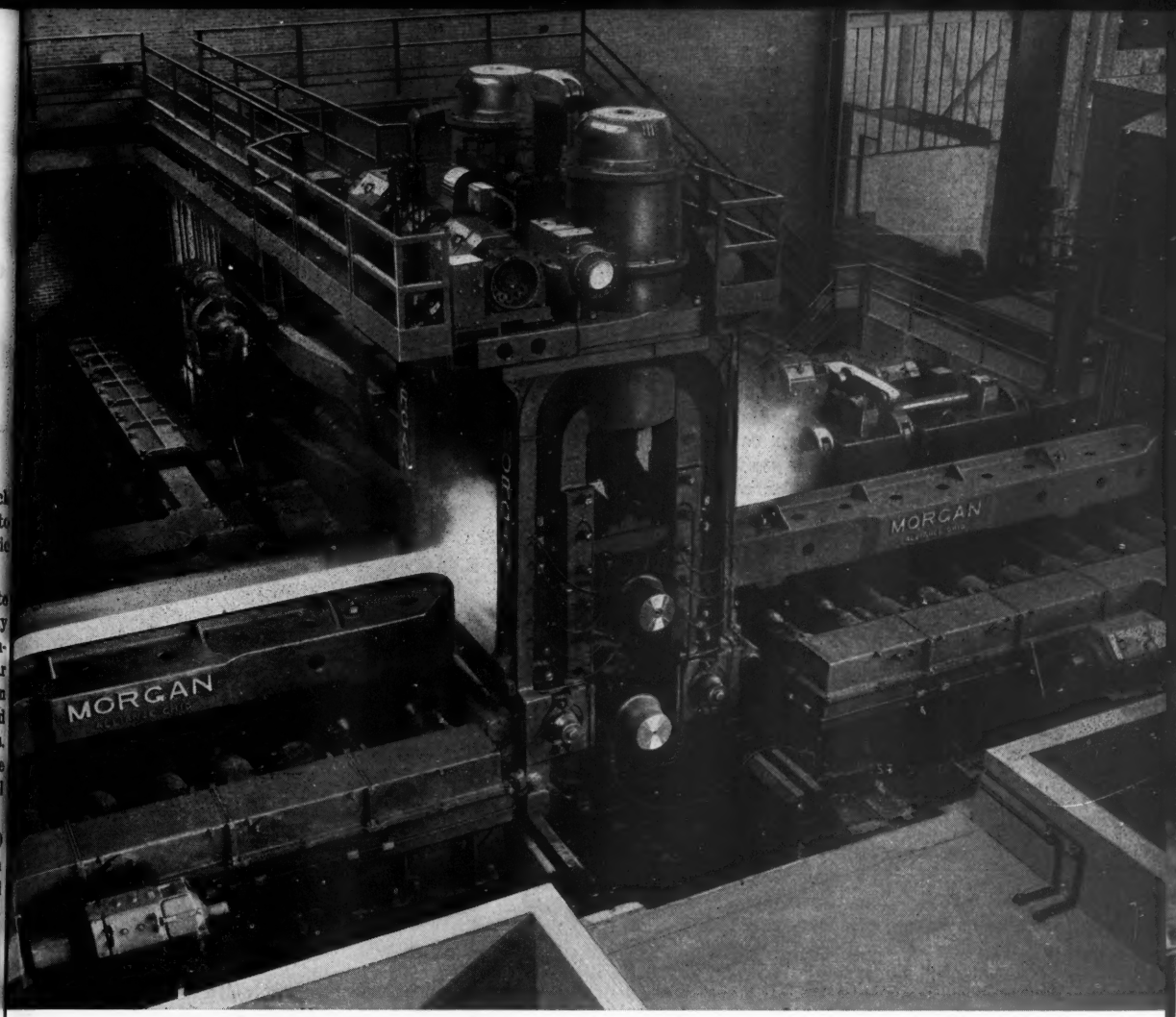
Both manufacturers and consumers of tin plate for years have contemplated the practical possibility of this development. Its feasibility (as in tin conservation measure) was demonstrated under similar circumstances during World War II by the Weirton Steel Co. when engaged in the production of gild clad steel strip for 0.30 and 0.50 caliber bullet jackets. This material carried 15 per cent copper on one side and 5 per cent copper on the other side of a steel base.

On June 8, 1949, an experimental lot of 50/100 differential tin plate was produced in the Weirton tin mill. (The designation 50/100 refers to 0.50-pound basis coating on one side and 1.00-pound basis coating on the other side.) Cans made from the above lot were tested in a limited number of food packs.

Early in 1951, it became apparent that tin conservation must be extended to the limit. On February 6, the Weirton Steel Co. announced (See STEEL, Feb. 12, page 48) that differential coated electrolytic tin plate would be produced in five combinations 25/50, 25/75, 25/100, 50/75, and 50/100. The savings in tin resulting from adopting the differential for the previously used grade (where both sides are coated

Schematic diagram of Weirton's No. 4 electrolytic tinning line





Morgan 40″ — 2 High Reversing Blooming Mill direct connected to two 3000 Hp. 40/100 Rpm. motors. Top roll and both spindles are hydraulically balanced by individual cylinders connected to an air hydraulic system. Speeds of motor driven screw down, feed rollers, mill tables and manipulator are regulated by variable voltage control.

Mill tables have box section type cast steel girders. Rollers are forged steel equipped with anti-friction type bearing cartridges. All gears have hardened teeth, are totally enclosed and operate in oil. Manipulator is of the electric overhead type with retractable heads affording maximum accessibility to all parts of the mill tables.

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equally) are shown in the accompanying table. These tin savings range from 16.7 per cent for the 50/75 combination to 50 per cent for the 25/100 combination.

Marking—A visible identification mark on each sheet of differential coated tin plate was essential. For years sheet products, such as cold rolled and galvanized, have been stamped or roller printed on one side with trademarks, grade or class designations, using all types of equipment from simple hand stamps and rollers to complex machines similar to rotary lithographing presses.

These conventional marking methods are impractical for the high-speed production of tin plate. A distinct pattern of small design, covering one side of each sheet, is necessary. This positive marking must provide rapid identification without interfering with can manufacture or impairing can service life.

In order to have an immediate means of marking which would meet the essential requirements, a fast-drying ink was tried. Using a small hand roller, it was possible to print a simple pattern on one side while the tin plate was uncoiled at the cutting lines at speeds up to 150 fpm, which is the maximum shearing speed. When a faster drying ink was obtained, the same device was used on the plating line, ahead of coiling, at speeds up to 1500 fpm with satisfactory results.

It was believed that this method of marking would fulfill the requirements whenever the plate was used for plain tin containers without enamel coating or lithographing, because the ink was water soluble and could be washed off by immersion in cold water. This method proved satisfactory for plain tin plate but failed to meet requirements when coating or lithographing operations were performed.

Following the experimental use of the inked roller on the line, a print was tried on the matte plate ahead of flow-brightening. The occasional occurrence of matte spots on finished plate indicated the possibility of a development along these lines.

Printing Media Employed — Numerous substances were tried as printing media, starting with the water soluble ink and including palm oil, cottonseed oil, glycerine, tinning flux, hydrochloric acid, ammonium chloride, zinc chloride, etc., in various solvents. The ink used had no effect while, in general, the acids and fluxes gave an overemphasized mark. Palm oil showed promise of being satisfactory. It resulted in a faint but distinct pattern in the tin coating after flow-brightening. A rubber printing roll was used for marking the initial experimental lots of plate. A diamond pattern was selected because distinct angular lines could not be mistaken when inspecting the plate.

In order to check the efficiency of the marking unit while running at high speed, a stroboscopic light is used on the finished material ahead of coiling. By adjusting light speed, the 1 x 1½-inch diamonds appear to be standing still, and the strip can be scanned from edge to edge. Use of the stroboscope simplifies the adjustment of roll pressure and oil

From a paper presented at the regional meeting of the American Iron and Steel Institute, Cleveland Hotel, Cleveland, Nov. 29.

TIN SAVINGS BY DIFFERENTIAL COATING

Differential Coating	Coating To Be Replaced	—Tin Savings— Pound Per Base Box	Per Cent	Additional Tin Plate Obtained—Per Cent
25/50	No. 50	0.125	25.0	33.3
25/75	No. 75	0.250	33.3	50.0
25/100	Common Cokes	0.625	50.0	100.0
50/75	No. 75	0.125	16.7	20.0
50/100	Common Cokes	0.500	40.0	66.7

Class Designation	Nominal Coating Weight, Pound Per Base Box
No. 25	0.25
No. 50	0.50
No. 75	0.75
No. 100	1.00
Common Cokes	(1.25 Pot Yield)

feed in the printer by making it unnecessary to stop the line for examination.

The palm oil used to mark differential coated tin plate by this process is removed by volatilization in the reflowing operation. The pattern which remains in the coating on the lighter coated side although faint, provides positive identification of the sheets. This method is used on all differential coated tin plate made at Weirton.

The first shipment of differential coated electrolytic tin plate was made on March 7, 1951. Up to November 1, 203,496 base boxes had been produced and shipped. This tonnage in the various coating combinations has been distributed to a number of different customers. Most of it has been of the 50/100 grade for plain packers cans for commercial packs of tomato juice and other tomato products. Additional applications for which differential coated tin plate has been shipped are closures, home canning lids, meat and soup containers. With the satisfactory performance of this large quantity of plate for both canmaking and canning, the production and uses of differential coated tin plate are advancing beyond the experimental stage of development.

While the lowest commercial limit of tin coating at present is 0.25-pound, the electrolytic lines of the steel industry are capable of lighter coatings down to flash coating of a few millionths-inch thick. With the remarkable progress made in high-speed can manufacture there remains for future development this promising unexplored field in differential coatings.

Airless Blasting Use Explained

Use of airless abrasive blasting to clean ordnance material is explained in a bulletin published by American Wheelabrator & Equipment Corp. Brochure covers fields such as the cleaning of shells and bombs, tank parts, artillery components and aircraft engine parts. Illustrated are machines used for preparing the surfaces of trigger guards and pins for bonderizing, roughening aircraft engine heads for aluminum metallizing, preparing aircraft landing gear fulcrums for cadmium plating.

Included is a demonstration of the various applications of shot peening in ordnance production. Applications of airless blasting for removing rust, scale and sand from castings, forgings and heat treated parts are also described. For a copy of the bulletin write to the company at 555 S. Byrkit St., Mishawaka, Ind., asking for bulletin No. 794.

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Honed Edges Cure Carbide Ailments

By CHARLES FRANK
Carbide Co-ordinator
Artillery Ammunition Dept.
Frankford Arsenal
Philadelphia

CARBIDE tool trouble can be diagnosed quickly and corrected providing the characteristics of this modern cutting material are thoroughly considered and controls set up to maintain in practice certain necessary procedures.

Some of the principal troubles encountered with carbide in the machining of ferrous metals are due to omission of pre-application honing of the cutting edges. Unlike high speed steel cutting tools, correct chamfers honed on carbide tools will decidedly increase their efficiency and strengthen cutting edges, without ill effects on normal cutting action.

Trouble Pattern—In productive machining of ferrous metals, trouble from unhoned carbide tools follow a pattern, simple to "trouble-shoot" either in single or multiple tool setups. The basic symptom is failure to hold size. This is a common complaint in multiple tool setups. Operator will be plagued by numerous shut downs to reset depth adjustments. This usually is followed by chip-outs or definite breakage.

A properly chamfer-honed carbide tool does not require more than one or possibly two compensating adjustments per regrind. Chipouts or breakage depend largely on the number of pieces machined with one tool before being replaced.

Chamfer honing must be accomplished prior to machine application to eliminate this as the possible cause for failure in the event similar tool trouble should occur.

What's The Answer?—Knowing the symptoms of unsatisfactory behavior of ferrous cutting carbides, let us discuss causes and cure. Tungsten titanium carbide is manufactured through process of powdered metallurgy involving carefully measured quantities of tungsten, carbon, cobalt and titanium combined to produce crater resistance when cutting ferrous metals.

These mixed powders are highly compressed into various blank shapes and sizes, then placed in a highly sintering furnace where cementation takes place largely through action of the cobalt. Finish processed blanks are brazed or otherwise fastened into suitable steel or cast metal shanks and ground by conventional methods for the particular use intended.

Finish grind operations usually are accomplished by diamond wheels of grain size selected in accordance with finish required.

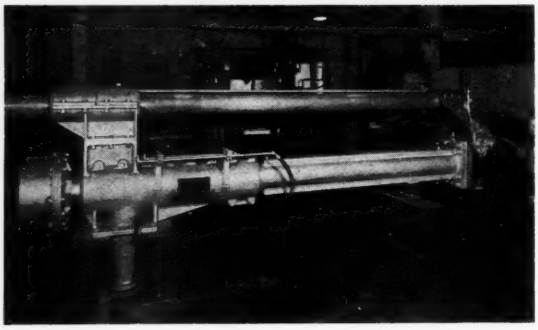
Resulting "diamond edges" will be found to be ragged or irregular under magnification. This condition is a characteristic of carbide tools.

Edges Crumble—Unhoned carbide tools when used in cutting steel, tend to crumble at the cutting edge due to this irregularity after grinding. Minute particles of the carbide break out, resulting in chipouts, serious breakage or cracking of tips. Sizes cannot be held because cutting edge is constantly breaking down under the "mushing" pressure of steel chips. Relief angles are also effected and cause heeling on the work. These combined actions cause premature wearing out and breakdown of cutting tools.

The remedy is simple. Using a 320 grit silicon carbide stone, chamfer all cutting edges 0.002-inch min. to 0.005-inch max. to 45-degree angles, using a reciprocating hand motion. If the tool contains a chip breaker, hone the back edge as well to relieve its sharpness. Chamfer honing should be attempted only by experienced carbide grinders or carbide application men. Proper maintenance of this procedure is important.

At Frankford Arsenal numerous tests have been made on machining steel cartridge cases and shells, both with unhoned and honed carbide tools. Results have been strongly favorable to the honed tools.

Electrode Holder Cuts Downtime



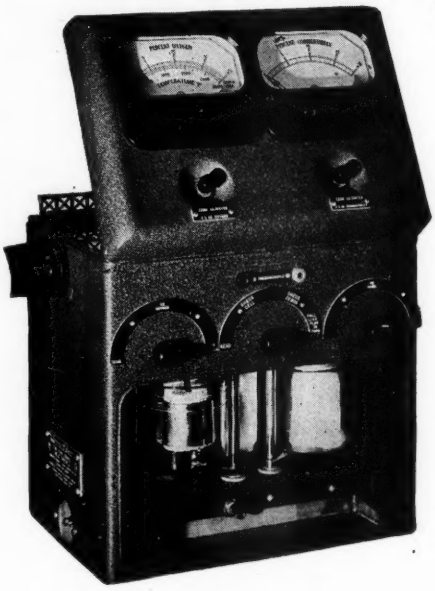
KING-SIZE automatic electrode holders built by the Whiting Corp., Harvey, Ill., permit automatic slipping of electrodes. Furnace down time is consequently reduced. This Hydro-Arc electrode holder is used on a 70-ton top charge furnace energized by a 20,000 kva furnace transformer. Graphite electrodes measure 20 inches in diameter and carry 40,000 amperes of 60-cycle ac current

Data Given on Cast Alloy Tools

Useful data on cast alloy metal-cutting tools is found in a 44-page tool manual and catalog, "Haynes Stellite Metal-Cutting Tools," available from Haynes Stellite Co., a division of Union Carbide & Carbon Corp. Booklet describes four different grades of cast cutting tool alloys: Haynes Stellite alloys Nos. 19 and 3, Star J-Metal and 98M2 alloy.

Included are tables giving proper cutting angles, speeds, feeds, and depths of cut for turning, boring, and milling. Cutting speeds are based on the relative machinability of various commonly machined materials. One table gives ratings for over 60 alloys and alloy steels. Methods for grinding tools and brazing tipped tools are also discussed. Copies of the booklet are available by writing the company, 30 E. 42 St., New York 17.

Mobilizing BTU's



Now that the "heat's on" for record production, the calls are increasing for the services of the Cities Service Heat Prover. This scientific instrument gives an accurate, instantaneous and continuous picture of combustion conditions in all types of furnaces.

You'll readily be able to calculate any oxygen excess, waste combustible matter, and potential fuel savings. The results are like an accurate "diagram" of corrective measures needed to conserve heat units for consistently higher production at lower cost.

You'll see profit in applying the Cities Service Heat Prover . . . *not an instrument you buy, but a service we supply!* Call or write your local Cities Service office about arrangements. Or simply return the coupon today.

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The acceptance of Magdolite among leading users of refractory dolomites throughout the country is the result of years of dependable service.

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JEBCO PRODUCTS

MAKERS OF BAKER'S MAGDOLITE

Electric Steelmakers Scrape Bottom of Scrap Piles

FEW steel plants have suffered the loss of production up until now because of the lack of scrap but we are now faced with the greatest shortage in the history of the country. Such was the warning sounded by E. L. Solomon, Max Solomon Co., Pittsburgh, in speaking on the "Outlook for Electric Steel Scrap," at the ninth annual Electric Furnace Steel Conference of AIME, Hotel William Penn, Pittsburgh, Dec. 6-8.

The speaker attributed the shortage to the large production of American steel mills in the face of the fact that scrap yards were emptied of No. 2 grade in World War II. Scrap drives sought to build up a fresh supply by the destruction of old fire engines, street car rails, locomotives, railroad cars and automobiles but without avail. Shipment of finished steel abroad failed to help matters. Battlefield scrap instead of being returned is being melted at Japanese plants to make steel for the Allies. Since we are going to produce guns regardless of other steel commodities every piece of available scrap must be found.

The scrap shortage is affecting all of our furnaces and even at this moment acid electrics are facing a critical situation. Basic electric scrap must be cut to short lengths and segregated according to chemical analysis. Scrap dealers are not spending extra time to accomplish this because the market price of such prepared scrap is no higher than the untreated material.

Mr. Solomon recommended that plants install shears and cut incoming scrap to specified lengths; also that steelmakers request their customers to return any scrap which arises in fabrication, and finally to request allocations from National Production Authority.

F. R. Franklin, ferroalloy section, National Production Authority, Washington, in reporting on the availability and regulation of alloys mentioned that the following were exempt from allocation up to 100 pounds for nickel, 25 for cobalt, 200 for molybdenum, 10 for chromium and 25 for tungsten. Other data concerning the available supply of various alloys are:

Nickel. About one-half of our nickel goes into steelmaking. Canada supplies practically all of this element. At present it is the most critical of alloy metals and the United States by international agreement has limited its use.

Cobalt. Anyone using this alloy is competing with jet manufacture. The largest tonnage of this alloy comes from Africa. Domestic consumption is limited by reason of international agreement. We agreed to use 10 per cent less than normal.

Tungsten. Tool steel industry uses two-thirds of this alloy. If this industry had not followed a conservation program we might have been obtaining electric light bulbs by allocation.

Columbium. This is the most tightly controlled of all the ferroalloys. The supply is limited. It has become a highly critical aircraft material.

Molybdenum. This country uses more molybdenum than all free world countries. From February to June no molybdenum was exported. Supplies are increasing slowly and by 1952 the output will be more attractive.

Manganese. This element is caught in an economic squeeze. The cost of manganese ores fob foreign ports increased 50 per cent; freight rates also are increased.

Ferrosilicon. New facilities for making this ferroalloy will be ready in the spring and production should be higher.

Chromium. This also is embraced in an economic squeeze and the low-carbon grade is in short supply.

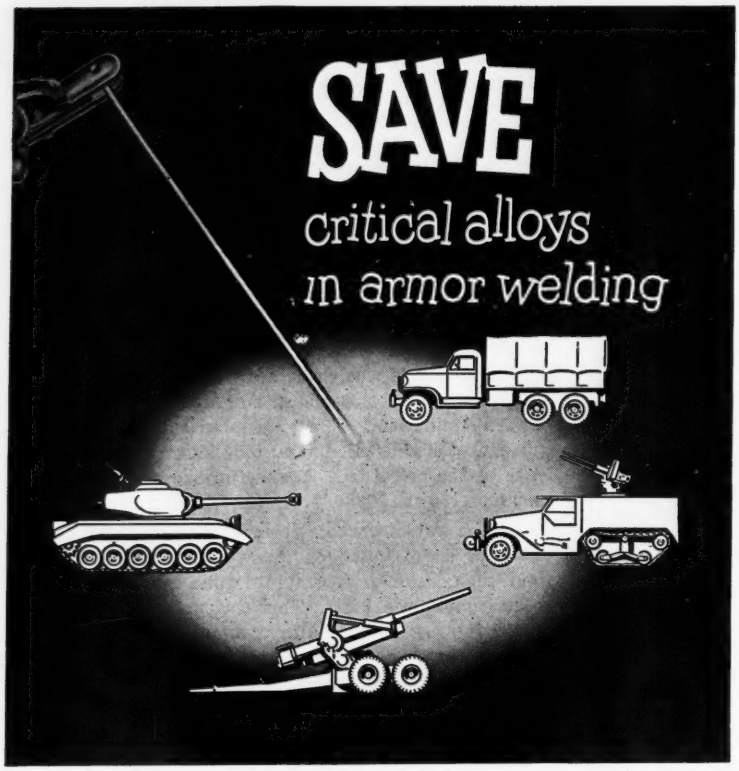
Discussion of this paper disclosed that nickel and other alloys are being recovered from stainless steel grinding dust by charging the grindings in the electric furnace in the proportion of 25 per cent of the charge.

A treatment developed in preparation for low-sulphur steels in times when low-sulphur scrap might not be available was explained by S. F. Carter, assistant melting superintendent, American Cast Iron Pipe Co., Birmingham. The desulphurization is accomplished with fine calcium carbide blown under the surface of the metal bath in the furnace by the pressure of an inert gas.

At the outset carbide from a pressure-tight hopper was forced by nitrogen gas through a rubber hose and then through a graphite tube inserted into the cast iron in the ladle. This was successful in desulphurizing cast iron. Later a metal pipe protected by a refractory was substituted for the graphite tube. The process was used in the furnace instead of in the ladle, therefore certain alterations of furnace practice were necessary. Two practices were developed, one in which carbide was injected early in the heat, before the oxidizing treatment; the other toward the end of a heat, during the deoxidizing treatment. In both methods, slag must be removed before the carbide treatment, and in acid furnaces the carbide slag should be removed after its reaction, in order to prevent reversion. On basic heats, the carbide can be left on the bath and thinned with fluorspar to serve as the second slag. The carbide size used was 14ND. Carbon dioxide finally was substituted at a saving for gas.

Following the usual oxidation and draining of the oxidizing slag, the heat was deoxidized with manganese and silicon. Instead of adding a second slag and waiting for it to become reducing and absorb sulphur, the carbide was injected and left on the bath as the second slag, after thinning to desired consistency with fluorspar additions. Sulphur was reduced almost immediately from 0.045 to 0.022 pct with 38.3 lb of carbide and 22.8 cu ft of gas per ton of steel. The efficiency of this heat was 16.6 lb per ton per 0.010 pct sulphur, which is somewhat better than the acid heats in this sulphur range. Nitrogen gas was used but, on the basis of later experience, carbon dioxide would be preferred.

In basic melting this carbide injection would be faster and more direct than conventional reducing practice. No additional steps are required. The second slag is simply injected into the bath in its already reduced and carbidic condition in contrast to usual practice in which the slag components are shoveled in and require a period of time to reach the proper condition to absorb sulphur. It should be practical to inject fluorspar with the carbide. Basic heat time can be shortened considerably.



Arcos Low Hydrogen Electrodes replace Stainless for sound armor welds

ARCOS LOW HYDROGEN ELECTRODES
Tensilend 70
Tensilend 100
Tensilend 120
Manganend 1M
Manganend 2M
Nickend 2
Chromend 1M
Chromend 2M

For over a year, Arcos Low Hydrogen Electrodes have been successfully producing sound welds on armor that meet the most critical specifications. This practical application has proved how quantities of scarce nickel and chromium can now be saved to meet other urgent defense requirements.

Since 1942 Arcos has produced low hydrogen electrodes to the same rigid quality controls applied to Stainless. Now offering the most complete selection in the low hydrogen field, Arcos electrodes assure you of consistently uniform welding performance on armor as well as on industrial applications.

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1500 South 50th Street • Philadelphia 43, Penna.

WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

Stainless Fabricating Methods

(Concluded from Page 95)

nitrogen which rapidly reduces its ultimate and yield strengths and causes it to become brittle. If this deficiency could be overcome, so that titanium would remain useful up to temperatures of 1600° F, a whole new field of applications would be uncovered. Combustion chambers, inner and outer cones, tail-pipes and transition liners for jet engines would use large quantities of the metal.

Because titanium's deterioration at continued high temperatures appears to be due to events which occur at the surface of the metal, great hope is held for its future in these hot spots if something can be done to protect its surfaces against oxidation and absorption. Ryan metallurgists are experimenting with new ceramic coatings on titanium to determine the success of these materials which have been so beneficial in preventing the oxidation of stainless steels at very high temperatures. Outcome of these important evaluations may have an important influence upon the use of titanium in these specialized fields.

Turbine Trend Is Less Weight

Trend in turbine design is a reduction in weight and cost through use of welded steel plate construction and by increasing casing inlet velocities, according to a paper delivered to the American Society of Mechanical Engineers by W. J. Rheingans, manager of Allis-Chalmers' hydraulic section.

Weight of a welded plate steel casing is 30 per cent less than a cast steel casing and cost is 20 per cent less to manufacture, says Mr. Rheingans. For the complete turbine this means savings of 14 per cent in overall weight and 20 per cent in total cost.

Casing velocities in the past have been limited to about 17 to 18 per cent of the total available velocity. Model tests, however, indicate little loss of efficiency when these velocities are increased to 23 per cent of the total. In some recent installations there has been a gradual increase in casing velocity with a resulting decrease in size, weight and cost of the casting, Mr. Rheingans explains.

Spraying Stops Tank Corrosion

After being flame-sprayed with polyethylene, a mild steel tank does duty as a container for muriatic acid at Southern Lead Burning Co., Atlanta. Constructed of ¼ and 3/16-inch mild steel plate, the tank measures 4 x 5 feet and has a depth of 3½ feet. Before the polyethylene coating was applied, the tank surface was cleaned and roughened by sand-

blasting to improve the bond between the metal and the coating.

A Linde DM-1607 flame-spraying gun was used to apply the coating, as well as for preheating the polyethylene. Several passes around the inside of the tank were required to build up an 0.05-inch coating. Speed of application was comparable to the speed of paint spraying. Coating was tested for porosity with a spark gap tester but no porosity was found. After six weeks, tests on the tank showed no corrosion of the mild steel plate, and no mechanical damage to the polyethylene coating.

Air Brakes Rejuvenate Crane

Southern Materials Co., Richmond, Va., brings a 20-year old whirler crane up to date with installation of a Westinghouse Air Brake Co. pneumatic control system. Air-powered actuators instead of a mechanical lever system apply clutches and brakes on the boom, holding line, closing line, and cab brake. Air pressure to the actuators is 80 pounds supplied by a 5-hp compressor. On operating levers, back pressure of 8 psi is used in lieu of springs for returning levers and pedals. On the foot-operated holding and closing line brakes, a preload of 5 psi is applied to give instant action and to minimize friction in the rigging or cylinders.

These adjustments give the operator a better sense of feel and permit more accurate functioning of the equipment. A safety feature of the control system is the automatic application of brakes if air supply pressure drops below 50 psi. This could occur in the event of a broken line in the main control system, compressor failure, excessive use of air or other accidental cause.

Induction Heat Zooms Output

Charles A. Richardson Co., West Mansfield, Mass., reports greatly increased production and fewer rejects since installation of a radio-frequency induction heater for hardening shuttle tips. Twenty-four different sizes of shuttle tips are selective hardened at a production rate ranging up to 3000 per hour. Selective hardening produces a high degree of hardness at points of maximum wear on the shuttle. Points of maximum stress are left relatively soft for toughness.

Floor space required for the company's previously-used carburizing furnaces was 200 square feet. Current equipment consisting of a Westinghouse 20-kw radio frequency generator and work handling equipment occupies only 30 square feet. The installation is fully automatic and can

ARCOS **Stainless Electrodes pass rigid quality control tests before you receive them**

Every time you weld with Stainless Electrodes, you want to be sure that the weld metal produced will be consistently of the highest quality—physically, chemically and metallurgically. Getting results like these can be guaranteed only through constant testing and retesting of every batch of electrodes manufactured. Arcos control specifications are the most rigid in the industry, and that's why every Arcos Stainless Electrode you use will deliver improved welding performance at lower welding costs.

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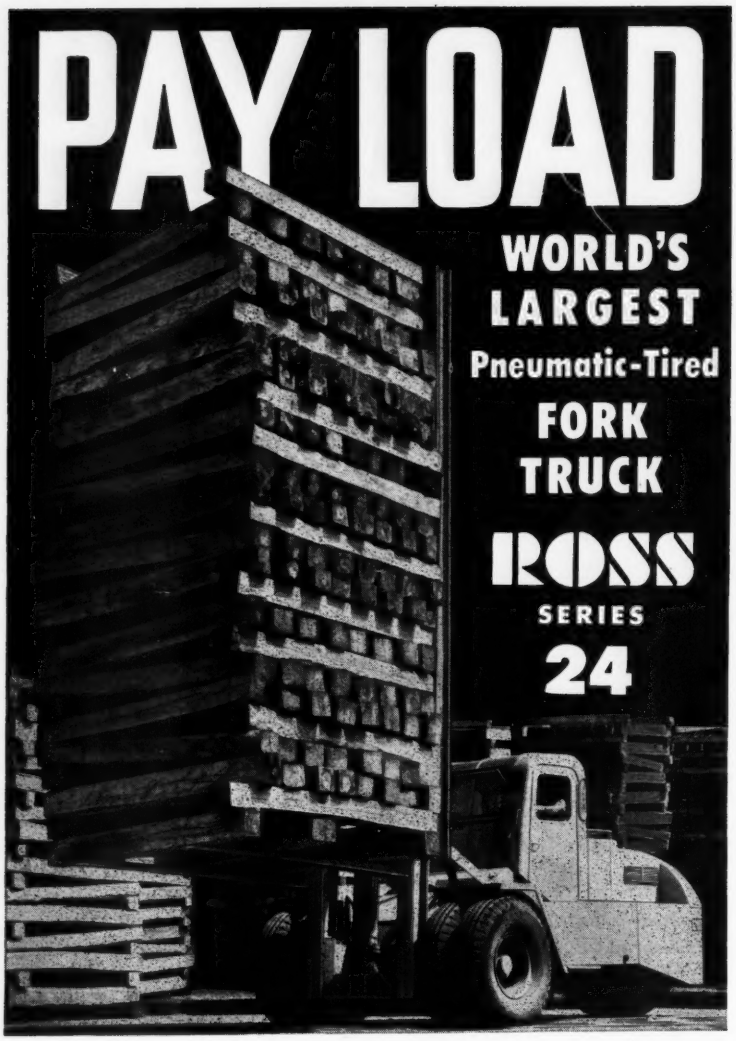
WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes



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be operated by unskilled labor. A process timer built into the machine controls the positioning, heating and quenching cycles, and assures uniform neat throughout, thereby materially reducing rejects.

Guns to Get Shock-Free Ride

Chrysler design railroad freight trucks, developed to protect railway freight shipments by reducing shock and vibration in transit will be government-specified equipment on new railroad ammunition cars going into service after the first of the year. The trucks are constructed on a principle of balanced suspension in which the body of the railway car is suspended by U-shaped swing hangers acting as pendulums.

Swinging action of the hangers permits a sideway movement that absorbs lateral shocks. Vertical shocks are cushioned by standard long travel coil springs softened and controlled by self-contained friction snubbers. Since the Chrysler trucks were made available in 1948 they have been used extensively on merchandise box cars, express and baggage cars.

Guide to Gear Finishing

"Gear Finishing—When, Where and How to Use It," a four-page folder is available from Michigan Tool Co., 7171 E. McNichols Rd., Detroit, 12. Economies and advantages of gear shaving are described and various types of gears, gear materials and gear sizes are given.

Line drawings and descriptive material explain how gears are finished by shaving and how accuracy is achieved. Underpass, modified underpass and transverse shaving methods are discussed in detail. Two methods for crown shaving are described and illustrated: One using reverse crowned cutters; the other an auxiliary drive that rocks the work while using uncrowned cutters.

Tubing Switch Saves Money

Tube Reducing Corp., Wallington, N. J., reports Brown Instrument Division, Minneapolis-Honeywell Regulator Co., saves 65 per cent in machining certain parts by a change in tube stock. Standard tubes used formerly for mercury instrument chambers required drilling, boring and reaming operations to obtain accurate size and finish.

Company now uses Rockrite compression-formed precision tubing in the production of tubular mercury chambers. Finish, size and uniformity of the bore are such that finished parts can be produced by honing only. This compression-formed tubing's smooth inside diameter lends

A pipe line goes submarine and Radiography proves each weld

Inspectors studying radiographs of completed welds in the 26-inch-diameter, 1⅛-inch-thick steel pipe.

NATURAL GAS from Texas makes its final plunge into New York City through a 4800-foot pipe line laid under the bed of the Hudson River. Each joint was welded. And with 450 lbs. p.s.i. inside and the pressure of silt and 90 feet of water outside, these welds had to be sound and set for a long life. To make sure, the contractor had radiographs made of every joint.

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Wouldn't you like to know how it is helping to increase business and improve production for others? Your x-ray dealer will be glad to tell you. Get in touch with him.

EASTMAN KODAK COMPANY
X-ray Division **Rochester 4, N. Y.**

Radiography...

another important function of photography

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Made for
FAST
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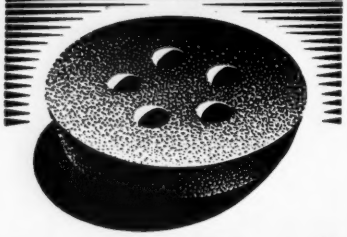

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Precision made Ceramic Strainer Cores speed production in many ways.

Foundry men all over the nation will tell you that AlSiMag Ceramic Strainer Cores help them turn out more good castings per molder per hour. AlSiMag cores are made especially for the molder—to help him work faster and with greater accuracy. They speed production and substantially reduce rejects.

These cores are flat, kiln-fired ceramic pieces, precision made to fit into the gate of the mold. They strain incoming metal and regulate its flow.

Many shapes and sizes • Gas free • Show little abrasion from metal stream • Withstand all normal foundry pouring temperatures. Even thermal expansion.

FREE SAMPLES: Write today for free samples of sizes in stock. Special samples to your specifications made at moderate cost. Try them in your own foundry. See for yourself.

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50 CORPORATION
YEARS OF CERAMIC LEADERSHIP
CHATTANOOGA 5, TENNESSEE

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itself well to accurate instrument calibration since resistance to mercury flow is practically negligible.

Bulk Conveyors Take Big Loads

Belt conveyors daily perform prodigious bulk handling feats and are capable of transporting tonnages far in excess of any current practical requirements, Laurance O. Millard, assistant general sales manager, Link-Belt Co., told members of the American Society of Mechaincal Engineers. Heightened efficiency and broadened versatility of the belt conveyor result from application of advanced engineering and materials like the new textile and steel reinforced belts. New solutions to the problems of drive motors and power application and more careful consideration of friction factors, slippage and slack are other contributions of mechanical engineers to better belt performance, Mr. Millard added.

Individual belt conveyor installations handle millions of tons of material per year in ore and coal mining, stone quarrying, public works, power plants, steel mills and at docks and terminals. Mr. Millard cited a coal mine-to-preparation plant conveyor system more than four miles in length, and at another mine a final slope belt 60 inches wide having a capacity of 3000 tons per hour.

Ballast Questions Answered

Two publications of the General Electric Co., Schenectady 5, N. Y. offer enlightenment on fluorescent lamps and ballasts. The first, a 20-page booket, uses cartoons, diagrams and nontechnical language to explain how a fluorescent lamp works and the part the ballast plays in its operation. Slightly more technical, the second describes how the company's ballasts are classified according to the amount of natural hum they emit. It explains how these ratings can be useful to fixture manufacturers and electrical contractors.

Hydraulic Cylinders Listed

Every standard cylinder offered to industry is listed in the new catalog section No. 105, announced by Rivett Lathe & Grinder Inc. Working drawings and specifications are furnished for each model and size cylinder, both standard and cushioned types, standard rod and 2:1 over-size rod, single and double end rods, internal and external threads.

All information relative to a model is shown on one page facilitating layout of circuits. Cylinder mountings described are rabbett, foot, trunnion, center, line, blind end flange, rod end

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industrial
GEARS
in a
hurry?

Call SIMONDS First!

A call to SIMONDS gives you the benefit of more than 60 years of specialization . . . assures fast, accurate reproduction of the most exacting specifications . . . and SIMONDS' central location cuts delivery time to a minimum. For all types of heavy industrial gears, up to 145" dia. and including cast or forged steel, gray iron, bronze, Meehanite, rawhide and bakelite—SIMONDS' production is geared to serve you promptly.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings, industrial V-Belts.

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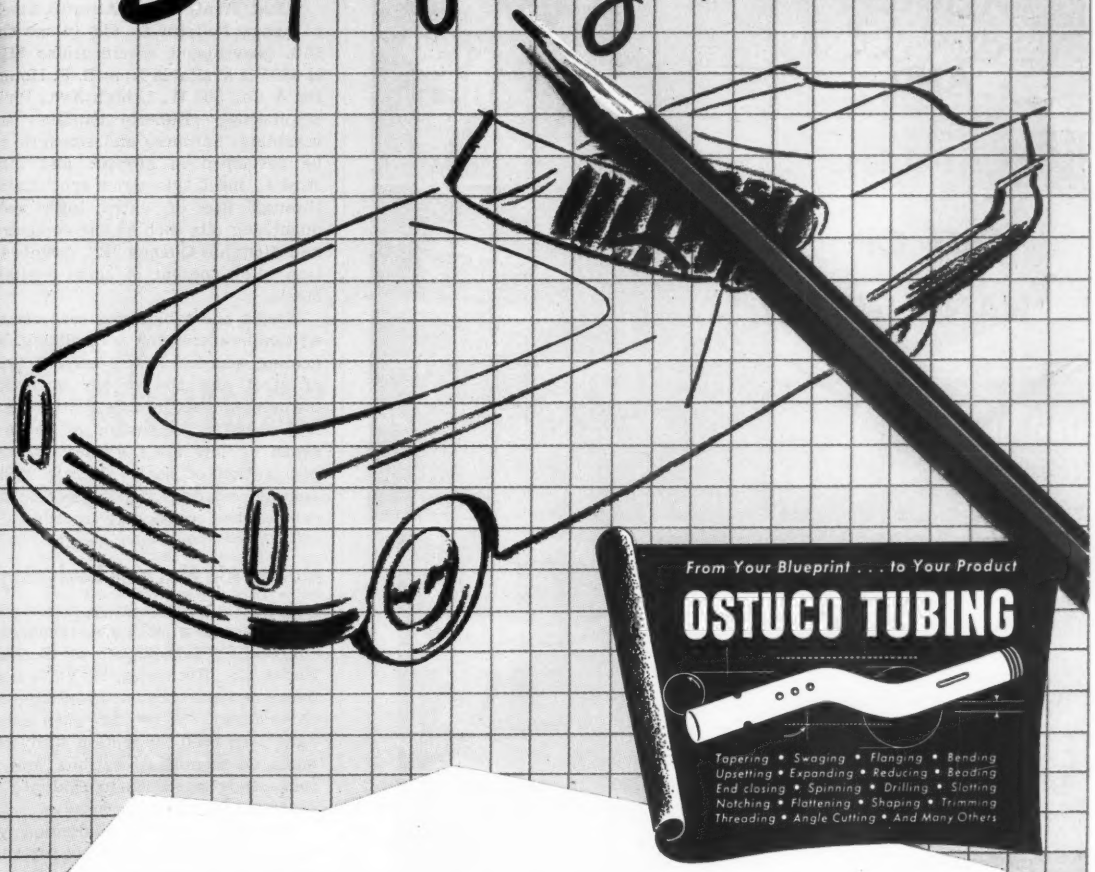
Shape of things to come...



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Whether your products are automotive or in some entirely different field, you doubtless are doing some long-range planning . . . looking beyond the immediate future to the time when increasing production for civilian use will again demand emphasis on advanced design.

In exploring the possibilities for the future, it will pay you to consider the many advantages of OSTUCO Steel Tubing. Hundreds of product engineers and manufacturers have found that no other material offers so many outstanding opportunities for improving design, increasing strength, reducing weight, enhancing beauty, and cutting cost.

Because of the growing needs of our armed forces, we cannot promise early delivery on new civilian orders, but we do wish to help you take advantage of OSTUCO Tubing in your plans for the future. Please feel free to call on our experienced tubing engineers for advice and information at any time.

THE OHIO SEAMLESS TUBE COMPANY

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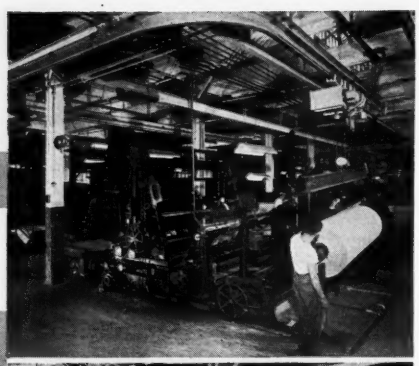
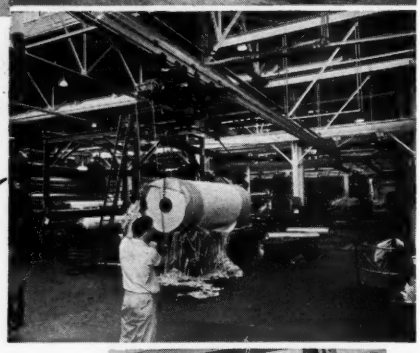
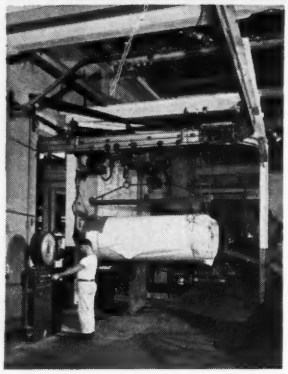
IT TOOK
"BACKACHE"
AND
"HEADACHE"
OUT OF
HANDLING





This American MonoRail Overhead Handling System entirely eliminated all problems previously encountered. The system, consisting of 1650 feet of track, 8 carriers with electric hoists and MonoTractor drive, a power-operated crane, three track scales and the normal complement of track switches, produced the following improvements:



1. Operator fatigue was greatly reduced.
2. Traffic flowed freely—no aisle congestion.
3. No side-tracking during travel—time saved.
4. Loads automatically weighed—no transfer to scales.
5. Damage to floors completely eliminated.
6. Damage to load greatly reduced.

Let an American MonoRail engineer show you how it can be done in your plant, at no obligation, of course. Send for C-1 Bulletin.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE ● CLEVELAND 7, OHIO

flange and clevis in 2 to 10-inch bore diameters, with strokes up to 96 inches. Catalog may be obtained by writing company at Brighton 35, Boston.

Guide to Quick Quenching

"Heat Treatment of Aircraft Steel," a 4-page bulletin to aid in meeting U.S. government specifications MIL-H-6875 is available from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33. Bulletin explains how maximum hardness and strength can be developed in aircraft and other steel to meet this strict specification through use of extra high speed quenching oils such as the company's new Houghto-Quench "K", despite the lean alloy content of some available steels.

Charts and tables give recommended temperatures for normalizing, annealing and hardening certain types of steel and the proper quenching medium in accordance with U.S.A. MIL-H-6875; comparison of hardness depth of low alloy steels; hardness penetration of some aircraft steels; Jominy end quench test results; and comparative quenching speeds.

Movies Aid Machine Designing

Industrial engineering department in co-operation with the mechanical engineering department at Eastman Kodak Co., Rochester, N. Y., is using micro-motion movies to study machine design. Heretofore such movies have been used for motion study purposes on manual operations, and for time study purposes to evaluate the performance of workers.

Company reports production was increased 400 per cent when new machines were designed after micro-motion movies revealed that many improvements in machine design could be made. On another job, such studies indicated production could be increased by designing the machine with pushbutton controls rather than toggle switches. Savings amounted to more than $10,000 a year.

Manual Lists Casting Benefits

Gray Iron Founders' Society's new manual, "Advantages of the Gray Iron Casting Process and Products," is aimed at those planning production of new or improved products. Manual shows how functional improvements result from casting simplicity and design freedom. It also explains the advantages of gray iron as a casting material, its availability, and ultimate low cost. Third in a series of three, it can be purchased at cost from the society at 210 National City-E. 6th St. Bldg., Cleveland 14.

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Wired Television

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Saving Labor · Increasing Sales
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for others

what can it do for YOU?

The Diamond "Utiliscope" is television which transmits by wire instead of by broadcast. It will provide a faithful and instantaneous reproduction at a distance of any scene, action, demonstration, or operation. It can look into furnaces, observe explosions or other dangerous operations without hazard to the operator.

Corners, walls, and other obstructions are no obstacle to the "Utiliscope." The image is clear and unmistakable, and as 60 individual image fields are transmitted each second (sound movies have only 48), every movement before the camera is transmitted accurately with no measurable time delay.

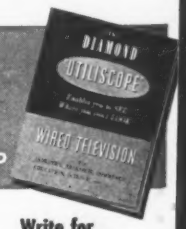
If you have any operation which needs to be seen close up, but which is too dangerous, inaccessible, costly, or inconvenient to be watched in person, you need the "Utiliscope." If it is to your advantage to show a demonstration, display, or other scene to a large number of people at a distance, the "Utiliscope" will do it.

The "Utiliscope" is not costly . . . has exceptional stability and reliability . . . requires no special skill for installation and operation. Write for Bulletin 1025 describing the "Utiliscope" and suggesting some of its many uses.

The "Utiliscope" (Registered U. S. Patent Office)

TYPICAL USES—*Studying destructive tests of engines • Watching flow of molten steel • Checking remote gauge readings • Observing conditions inside furnaces • Viewing nuclear research • Coordinating materials flow on conveyors*

DIAMOND POWER SPECIALTY CORP.
First in Industrial Television
LANCASTER, OHIO
Diamond Specialty Limited • Windsor, Ontario



Since 1903, Diamond has Manufactured Quality Equipment for Industry

4106

Write for Bulletin 1025

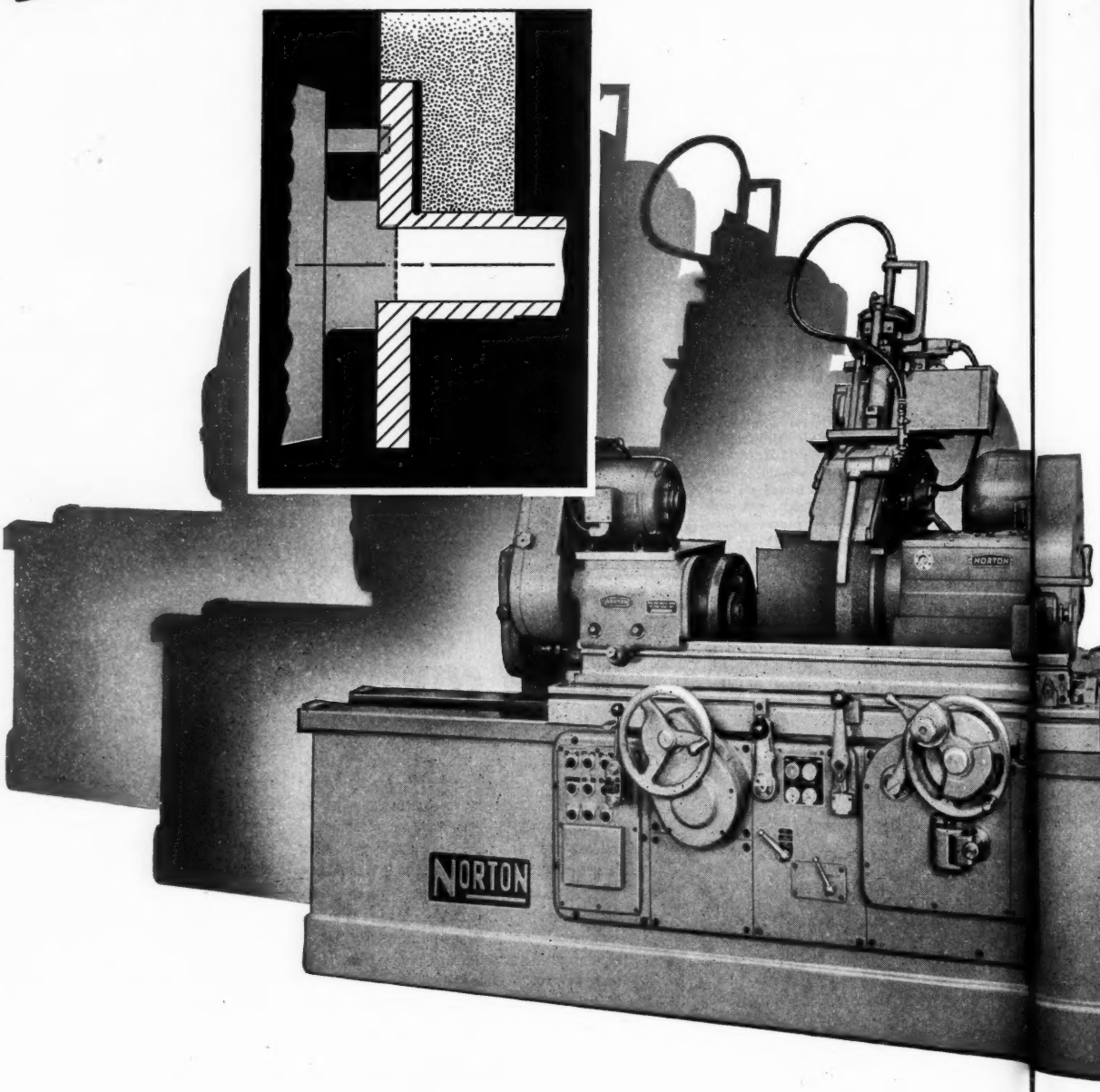
This ad is "FISHING"

Frankly, we don't know what uses you may have for the "Utiliscope" (Wired Television) . . . so in the adjacent ad we are simply telling you what it will do. Based on our experience in other fields, we suspect there are many places where the "Utiliscope" will help you improve product quality, save manpower, prevent accidents or increase production.

If you want to look into the possibilities of the "Utiliscope", simply write us for a copy of Bulletin 1025F which explains the equipment and shows various applications. Please address your request to Department "F".

DIAMOND POWER SPECIALTY CORPORATION
Department "F"
Lancaster, Ohio

One NORTON TYPE CTU GRINDER

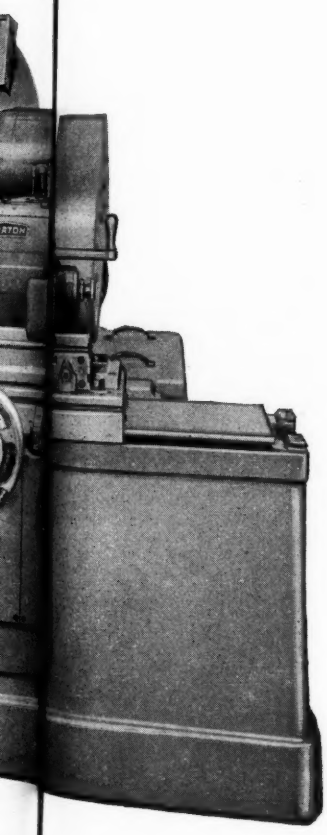


Making better products to make other products better

NORTON COMPANY, WORCESTER 6, MASS., U. S. A.

DISTRICT SALES OFFICES: HARTFORD • NEW YORK • CLEVELAND • CHICAGO • DETROIT

Replaces 2 Machines ← Doubles Production ← Saves Time and Labor ←



PROBLEM

In producing a transmission part, a prominent automotive concern was grinding two diameters on the part in separate operations. By this procedure, only 300 complete pieces were being obtained in 8 hours.

ACTION

To combine these operations, a Norton 10″ Type CTU Semiautomatic Grinder was purchased. This machine was equipped with an Electric-Eye Work Positioning Arrangement to speed loading, and an Automatic Wheel Guard Type Truing Device for rapid truing of the single grinding wheel to both required diameters.

RESULT

A 100% increase in output was obtained. The fast action of the new machine plus the speed of automatic truing, and the reduced time for handling doubled output for this manufacturer to 600 complete pieces in 8 hours.

To Economize Modernize with NEW

NORTON

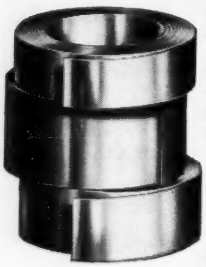
GRINDERS and LAPPERS

M605

CARS, CLIPS, CANISTERS

CONTINUOUS FEEDING

FOLLANSBEE COLD ROLLED STRIP is widely used wherever high-speed automatic machines turn out products in great numbers. Continuous feeding from coils is essential to maintaining volume like this. That's why Follansbee Cold Rolled Strip is furnished in continuous coils that keep automatics in action for real productioneering teamwork.



Follansbee Cold Rolled Strip Steel is manufactured to specifications, in tempers and finishes for most industrial applications. Let the nearby Follansbee Representative tell you about Follansbee Steel Service, tailored to fit *your needs.*

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

SEAMLESS TERNE ROLL ROOFING • COLD ROLLED STRIP
POLISHED BLUE SHEETS AND COILS

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Mills*—Follansbee, W. Va.

Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

CALENDAR
OF MEETINGS

January 8, Mining & Metallurgical Society of America: Annual meeting, Mining Club, New York. Society address: 11 Broadway, New York.

January 8-10, National Constructors Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

January 13-15, Institute of Scrap Iron & Steel: Annual meeting and exhibit, Waldorf-Astoria Hotel, New York. Institute address: 1729 H St. NW, Washington. Executive vice president: Edwin C. Barringer.

January 14-17, American Management Association: General management conference, Biltmore Hotel, Los Angeles. Address: 330 W. 42nd St., New York.

January 14-17, Plant Maintenance Show: Convention Hall, Philadelphia. Manager: Clapp & Poliak Inc. Address: 341 Madison Ave., New York.

January 14-18, Society of Automotive Engineers: Annual meeting & engineering display, Hotel Book-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 16-17, Steel Shipping Container Institute: Winter meeting, Pierre & Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 16-18, Southern Industrial Distributors Association: Mid-year meeting, Edgewater Gulf Hotel, Biloxi, Miss. Association address: 208 Peachtree Arcade, Atlanta 3. Secretary: E. L. Pugh.

January 17, American Coke & Coal Chemicals Institute: Western regional meeting, Congress Hotel, Chicago. Institute address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

January 18, Malleable Founders Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

January 18-19, American Medical Association, Council on Industrial Health: Annual meeting, William Penn Hotel, Pittsburgh. Association address: 535 N. Dearborn St., Chicago 18. Secretary: Dr. C. M. Patterson.

January 21-22, Industrial Furnace Manufacturers Association: Mid-winter meeting, Schenley Hotel, Pittsburgh. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

January 21-24, American Roadbuilders Association: 50th anniversary meeting, Hotel Rice, Houston. Association address: 1319 F St. NW, Washington 4. Secretary & executive vice president: Lt. Gen. Eugene Reybold.

January 21-25, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

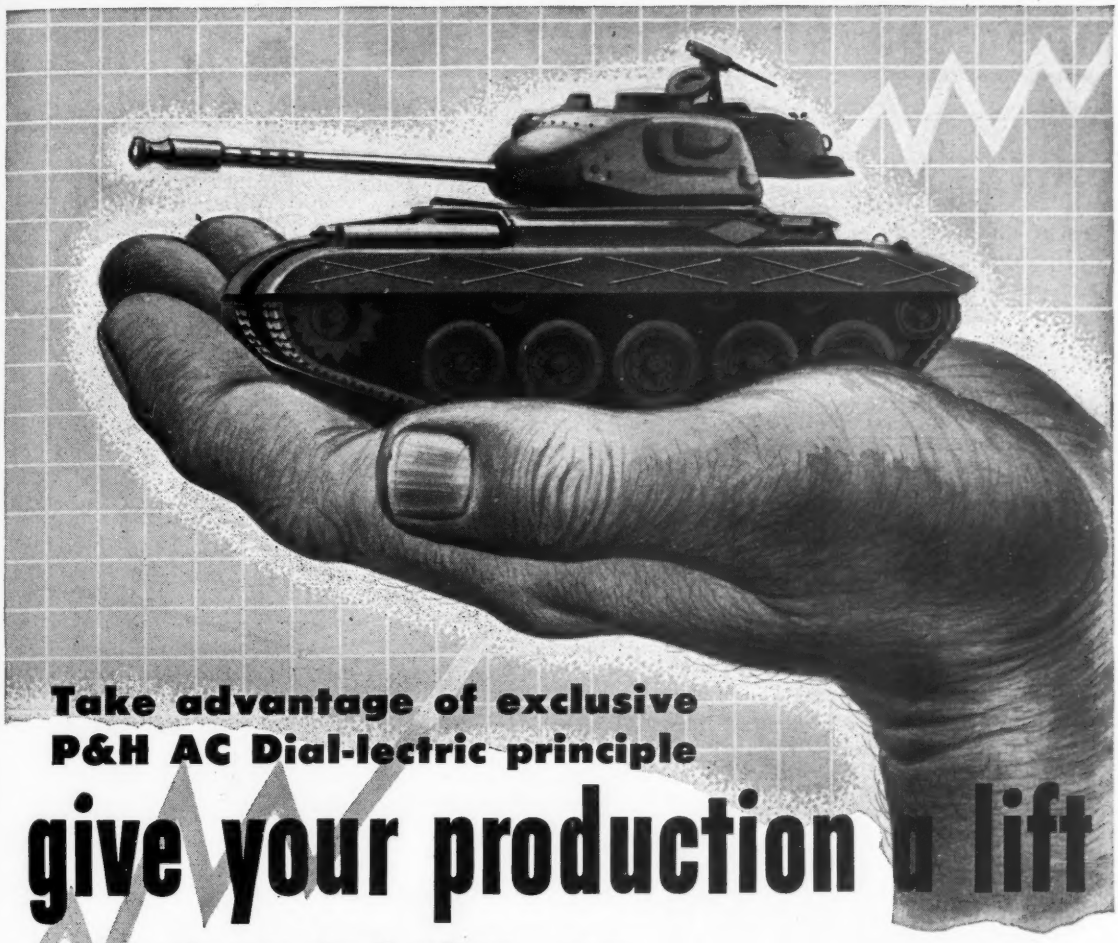
January 23-24, National Industrial Conference Board: Winter meeting, Waldorf-Astoria Hotel, New York. Address: 247 Park Ave., New York 17. Assistant director, conference division: (Mrs.) I. E. Brown.

January 24-25, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago 5. Secretary: J. Dwight Evans.

January 27-31, Associated Equipment Distributors Association: Annual meeting, Hotel Stevens, Chicago. Association address: 360 Michigan Ave., Chicago. Secretary: P. D. Herman.

January 28-30, Truck-Trailer Manufacturers Association: Annual meeting, Shamrock Hotel, Houston. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

January 31-February 1, American Society for Metals: Mid-winter meeting, William Penn Hotel, Pittsburgh. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.



Take advantage of exclusive P&H AC Dial-lectric principle

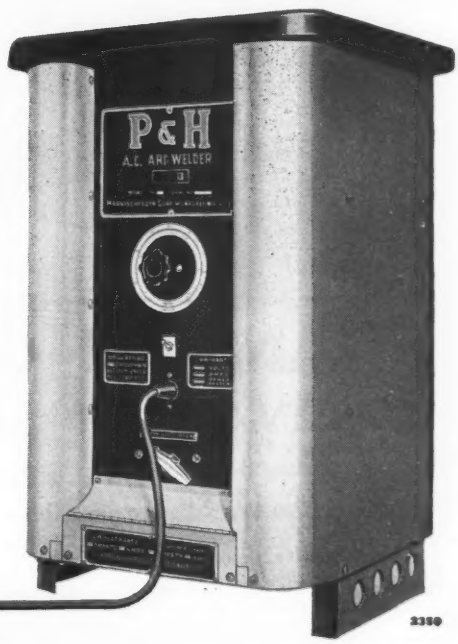
give your production a lift

— with safe, open-circuit voltage . . . easy, quick-start arc . . . time-saving, built-in remote control . . . compact AC design

Armor plate welding calls for low-hydrogen or stainless steel electrodes. P&H, pioneer in the low-hydrogen field, also offers the AC welder that gives you the best weldability with these rods — for greater production.

Your men like the P&H AC Dial-lectric — like its safety under the most adverse conditions; like the easy, quick-start arc, the elimination of arc-blow. And they get more done! Get sounder, better looking welds in less time, thanks to built-in remote control which lets them select the right heat at the work, turns *walking time* into *welding time.*

Because these welders give production such a lift, P&H has stepped up its delivery schedules to meet defense demands without delay. Get your production rolling in high gear. Order your P&H AC Welders today. Capacities up to 650 amps. Take advantage of this delivery situation while it lasts.



P&H **WELDING DIVISION**
4411 W. National • Milwaukee 14, Wis.
HARNISCHFEGER CORPORATION

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania

The World's Largest Job Galvanizing Plant

A. J. DIEBOLD, President

in the heart of the STEEL INDUSTRY

HOT DIP GALVANIZING

galvanizing . . . . pickling . . . . painting . . . . oiling

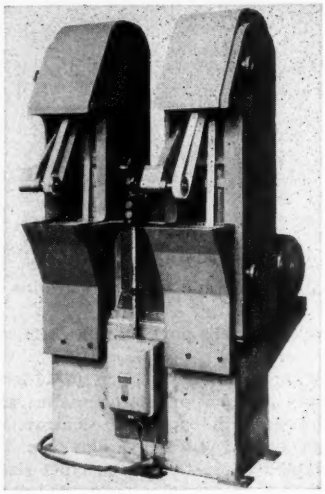
New Products and Equipment

Machine Grinds Bucket Blades

USE REPLY CARD—CIRCLE No. 1

Production Machine Co., Greenfield, Mass., offers a machine specially designed for both grinding and finishing various types of bucket blades, using abrasive or felt belts, by the off-head grinding method. Grinder has extended housings to mount platen rolls up to 4 inches wide. It is equipped with ball bearing spindle for contact wheels up to 1 inch wide by 3 inches diameter. Spindles are located at a comfortable working level and permit 180-degree abrasive wrap or felt at point of contact.

Contact wheels are formed to match the contour of various types



. . . grinds, finishes with abrasive belts

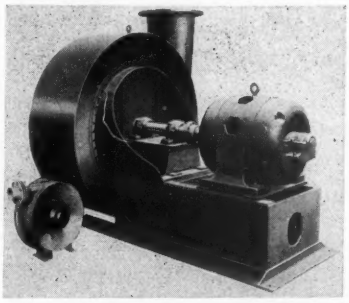
and forms of blades to be ground or finished. The unit is available in either single or duplex type. Thus, if different grip belts are required, the duplex machine can be equipped so operator can perform the two operations on one machine. Belts are used up to 4 inches wide.

Blower Capacities Increased

USE REPLY CARD—CIRCLE No. 2

Line of steel blowers in increased capacities is offered by Billmyre Blower Division, Lamson Corp., Syracuse, N. Y. Standard models range to 200 hp. Three styles are offered: Model SG (multi-stage) and SM (single-stage), operating at 3500 rpm; and model ST operating at 1750 rpm. Outlet pipe sizes are 4 to 24 inches, all flange fitted. Outlets can be oriented in any of 14 positions, determined by discharge angle and offset from shaft center line desired. Delivered air pressures to 3 psi are available.

Smaller models, through 10 hp, are applicable for mezzanine or elevated mountings in either vertical or horizontal positions. Although designed on a standard basis for air only, they



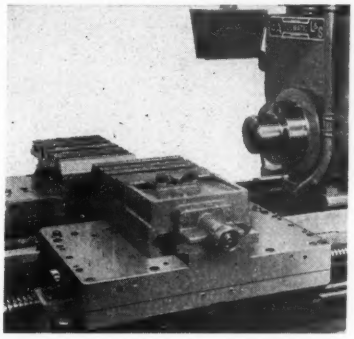
. . . standard models range to 200 hp

can be adapted to use for corrosive, poisonous or explosive gases on special orders calling for stainless or sparkproof materials and special gasketing. In the larger sizes, principal uses include industrial vacuum cleaning systems, pneumatic material transport, carburetion for combustion, liquid serration and agitation and gas or air circulation.

Cross Slide Increases Rigidity

USE REPLY CARD—CIRCLE No. 3

Increased rigidity for forming, grooving and necking is provided by a cam-operated rear cross slide developed for the Duomatic lathe by Lodge & Shipley Co., 3071 Colerain Ave., Cincinnati, O. The arrange-



. . . moves into workpiece at constant rate

ment replaces the former rack and pinion slide. Designed particularly for above operations and not for turning, it is made heavier to handle effectively the most difficult forming cuts.

REPLY CARDS

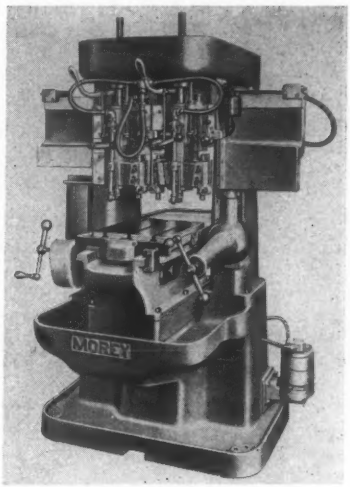
on page 143 will bring you more information on any new products and equipment in this section.

If turning with the rear slide is necessary, rack and pinion cross slides can be furnished as optional equipment. Cam is constructed to move the slide into the workpiece at a constant rate. When tools reach the end of stroke, inward feed halts in the cam slot, making the cam itself determine diametral accuracy with absolute uniformity.

Vertical Profiler Redesigned

USE REPLY CARD—CIRCLE No. 4

Redesign of the No. 12M high speed vertical profiling and milling machine is announced by Morey Machinery Co. Inc., 410 Broome St., New York 13, N. Y. Among changes en-



. . . splined shafts replace keyways

gineered on this model are improved spindle bearings and use of splined shafts to replace keyways, including the spindle. Hardened and ground steel ways are used on the cross-slide; travel head is mounted on rollers that ride on ball bearings to eliminate friction and help assure easy movement. To facilitate operation, the gear train is simplified and control handle relocated. Slotted

HALLDEN
Automatic Shears

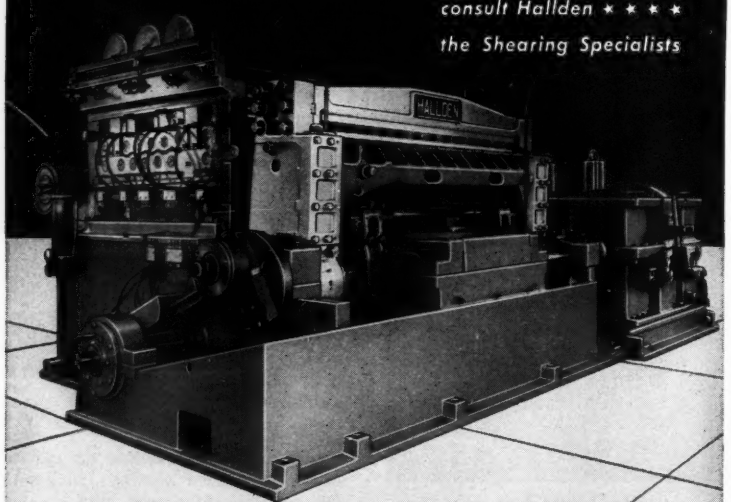
★ FLEXIBLE DESIGN

★ CUTTING ACCURACY

★ CONTINUOUS FEED

★ RUGGED CONSTRUCTION

consult Hallden ★ ★ ★ ★
the Shearing Specialists



THE HALLDEN MACHINE COMPANY
THOMASTON, CONNECTICUT

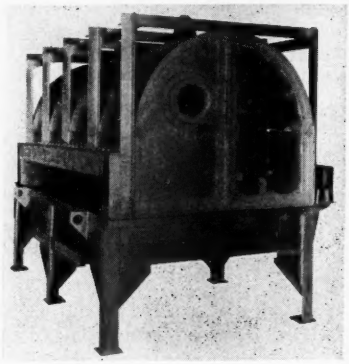
Sales Representatives
The Wean Engineering Co., Inc., Warren, O. T. E. Dodds, Pittsburgh, Pa.
W. H. A. Robertson & Co., Ltd., Bedford, England

table, cross-slide on table stops, and a drawbar and collet become standard equipment. Profiler is available in double spindle types.

Slot-Type Forging Furnace

USE REPLY CARD—CIRCLE No. 5

Slot type, 9-foot forging furnace that covers the full range of heating requirement to 2900°F is offered by Ra-Diant Heat Refractories Inc., Rear 1413 W. Tusk Ave., Canton, O. Furnace features a removable dome that can be lifted easily and 5-inch refractory liner thickness. Efficient insulation and positive heat transfer to the stock are attained by refrac-



. . . adapts easily to various billet sizes

tory material's physical and chemical properties.

Fabricated construction (5/16-inch skin) and design characteristics afford uniform expansion, contraction and stress relief. Design can be adapted easily to various billet sizes by interchangeable arch of bolted wedge blocks or ordinary fire brick used in building the hearth. Removable bumper section extending entire length of rear wall, at maximum slot height, provides resilience and restricts ramming damage to that section. Work chamber is 9 feet long, 5 feet wide and 5 feet high; burner ports are in end wall sections.

Cabinet Temperature Hits —40°F

USE REPLY CARD—CIRCLE No. 6

Low-temperature industrial freezing cabinet, introduced by Brewer-Titchener Corp., Binghamton, N. Y., can lower temperatures to —40° F. Among its applications are rivet cooling, shrink fit assembly, size-stabilization, storing punched and formed aluminum alloy parts and treating hardened steel. It has 2½ cu ft of refrigerated storage space in 40 x 36 x 32-inch overall measurement. Power is supplied by a ⅓ hp, 110 v ac hermetic unit. Lid is opened by a

PROMPT DELIVERY
Standard Sizes
Eaton Springtites—Reliance Spring Lock Washers pre-assembled on bolts or screws.
Sems—multi-prong washers similarly pre-assembled.

Automatic "TAKE-UP" between bolt head and nut

- Wear and looseness are certain to develop in bolted assemblies as a result of service conditions.
- Reliance Spring Lock Washers automatically exert reactive pressure to compensate for such a condition and maintain tension in the bolted parts, thus minimizing wear.
- They also serve as hardened thrust bearings, permitting greater applied tightening torque.
- There's a type of Reliance Spring Lock Washer for every fastening application and requirement. Write for Bulletin W50.

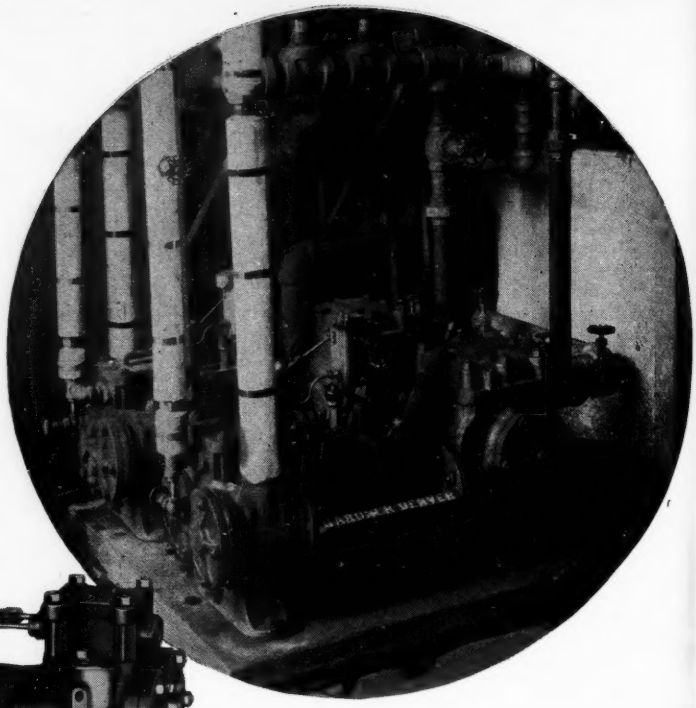
RELIANCE *Spring* **LOCK WASHERS**

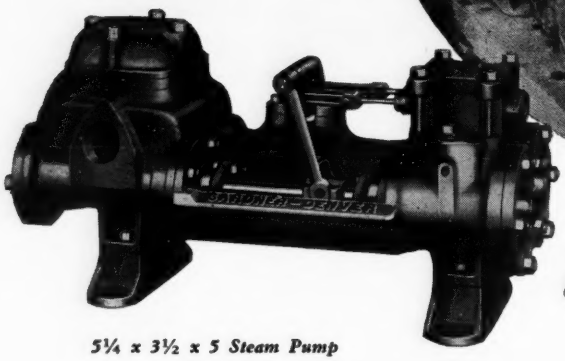
EATON

MANUFACTURING COMPANY, RELIANCE DIVISION

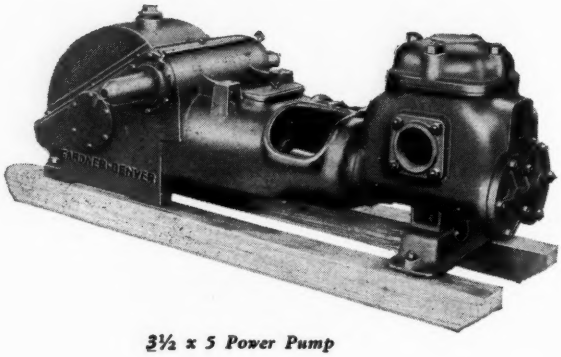
OFFICE AND PLANTS • MASSILLON, OHIO
SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL
In Canada: Eaton Automotive Products, Ltd., London, Ont.

2-Way Economy with GARDNER-DENVER Boiler Feed Pumps





5¼ x 3½ x 5 Steam Pump



3½ x 5 Power Pump

1. POWER ECONOMY! Gardner-Denver Steam Pumps have short and direct steam ports for greatest steam economy. The steam valves stay tight at all steam pressures.

Gardner-Denver Power Pumps are equipped with friction-defying Timken tapered roller main bearings. Herringbone gears and large eccentric bearings transmit more of the power into useful pumping.

2. IN THE SIZE YOU NEED! Gardner-Denver Boiler Feed Pumps are manufactured in a wide range of sizes, for any type of drive. Our pumping experts will gladly help you select just the right combination for maximum economy in your plant.

Write us today for further information.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada:
Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

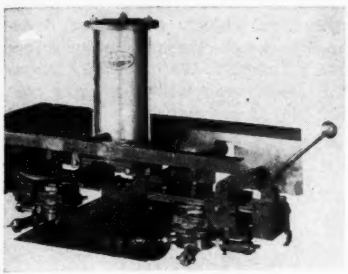
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

foot treadle, leaving both hands free for handling frozen parts or materials. Another use can be application of cabinet's sub-zero compressed air to metal cutting tools during milling to increase tool life.

Automatic Conveyor Lubricator

USE REPLY CARD—CIRCLE No. 7

Automatic conveyor lubricator, with enclosure designed for operations where an unusual amount of dirt, dust or spray circulates, is announced by J. N. Fauver Co. Inc., 49 W. Hancock, Detroit 1, Mich. Lubricator is self-contained grease-type,



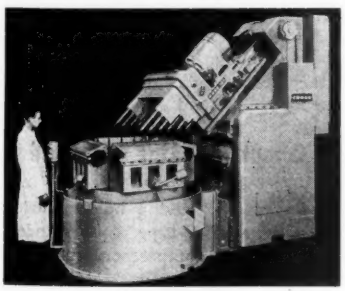
. . . . delivers measured quantity of lubricant

driven by contact with trolley wheels. As trolley wheel approaches lubricator, hub engages sleeve of one of the five pumping units. Continued rotation of the lubricator forces pumping unit inward, delivering a measured quantity of lubricant to the wheel bearing. Cam located in the pump housing snaps another pumping unit into position to contact the next wheel.

Machine Finishes Cylinder Heads

USE REPLY CARD—CIRCLE No. 8

Machine for drilling and chamfering cylinder heads is announced by Cross Co., Detroit 7, Mich. One unskilled operator is needed while the



. . . drills, chamfers 170 pieces per hour

tool drills 12 angular holes and counter-sinks eight manifold mounting holes in 170 pieces per hour. Design

ROUND

3/8" to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

On Land . . . On Sea . . . and in the Air

During World War II Michigan tubing was used in many different kinds of equipment, both in straight lengths and fabricated, for the armed forces on land, on sea and in the air. Because of the design simplification it makes possible, its economy, accuracy, and availability, Michigan tubing made a major contribution to the success of American arms.

Michigan's facilities are again available to manufacturers of defense products. The obvious advantages of the use of electric resistance welded steel tubing in thousands of applications, to save time and cost, make it ideal for defense as well as for regular consumer items.

We'll be pleased to have you call in our engineers to determine just how Michigan tubing can do a better job for you in the manufacture of your product.

Michigan ELECTRIC RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME IN STEEL TUBE PRODUCTS CO.

More Than 30 Years in the Business

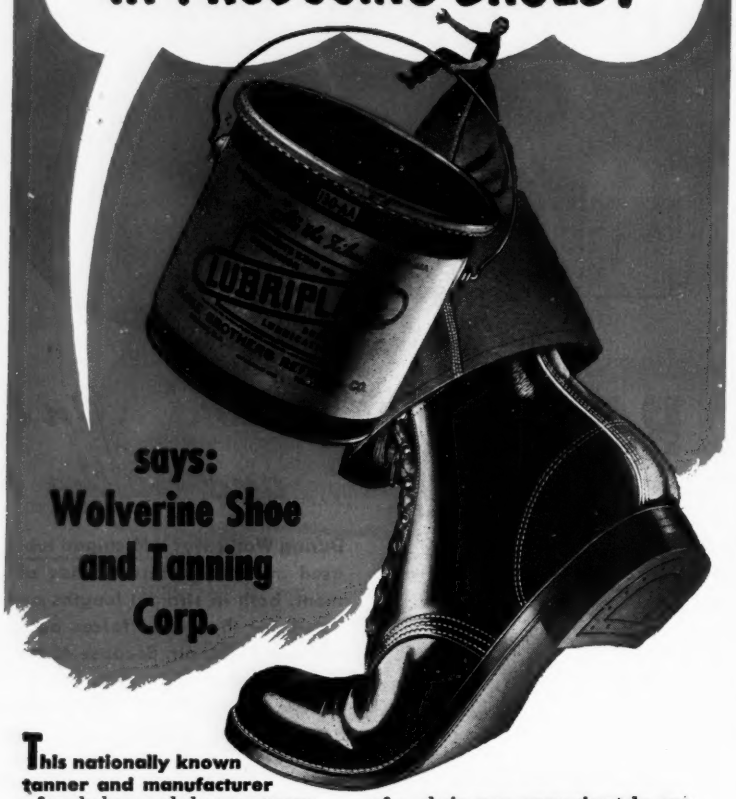
9450 BUFFALO STREET • DETROIT 12, MICHIGAN

FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis —Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon —James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.

THIS LUBRICANT SAVES 7 TIMES ITS COST IN PRODUCING SHOES!

says: Wolverine Shoe and Tanning Corp.



This nationally known tanner and manufacturer of work shoes and gloves writes us . . .

". . . You recommended to us LUBRIPLATE NO. 100 for lubricating the chain drive on our paddle wheels which turn the hides immersed in a solution in concrete vats. The chain, during use, is always soaked. The solution is sometimes acid and sometimes caustic. Up to the time of your recommendation, we had not found any lubricant that would stay on the chains for any appreciable time.

"Heretofore, the average life of a chain was approximately one year. We have applied LUBRIPLATE to these chains every two weeks for two years. Since then, not one new chain has required replacement, and they are still going strong.

"At this time it appears that *for every dollar we have invested in* LUBRIPLATE, *we have saved seven dollars* in chains with actual savings still to come."

WOLVERINE SHOE & TANNING CORP.
Rockford, Michigan

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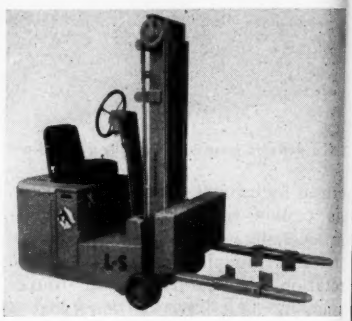
features the heavy duty index table that incorporates both manual and automatic control cycles. If table is jammed while indexing, due to improper loading, fluid motor drive prevents damage by reversing rotation and removing obstruction. Machine has hardened and ground ways, hydraulic feed and is constructed to J. I. C. standards with stranded wire electrical installation. It has the company's standard sub-assemblies to facilitate maintenance and provide flexibility for part design changes.

Clamp Truck Handles Drums

USE REPLY CARD—CIRCLE No. 9

Hydraulically operated clamping forks to handle drums and other cylindrical objects have been developed by Lewis-Shepard Products Inc., 191 Walnut St., Watertown 72, Mass., for the company's Spacemaster "49" electric fork trucks. Horizontal



. . . double-acting rams close 15 inches

movement of forks is produced by two double acting hydraulic rams synchronized to give uniform motion to each fork. Minimum distance between forks is 12 inches; maximum distance is 27 inches. Clamping pressure is controlled by hydraulic bypass relief valve, adjustable to suit loads to be carried.

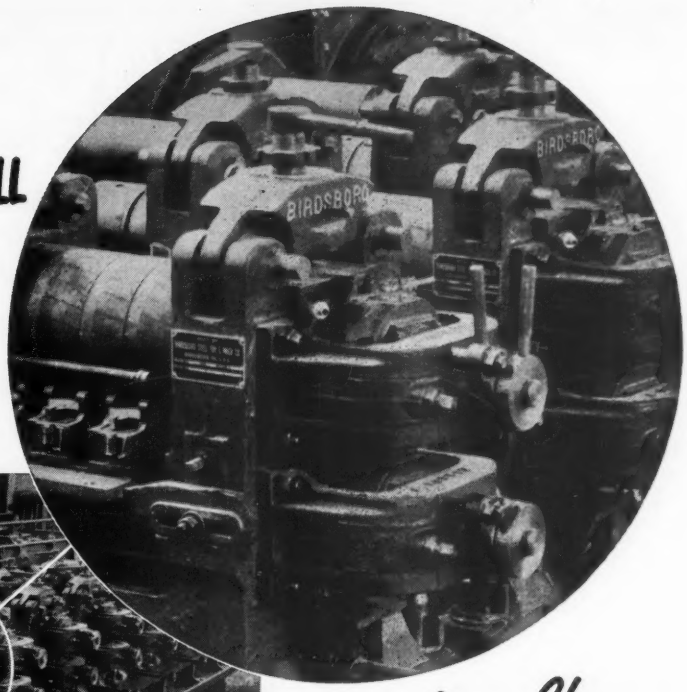
Forks can be fitted with self-aligning rubber-faced gripping pads when required. Pads are mounted in pairs, on sleeves that fit over forks and can be removed when truck is used in conventional manner. Clamp attachment is designed for use on the 1000, 1500 and 2000-pound trucks.

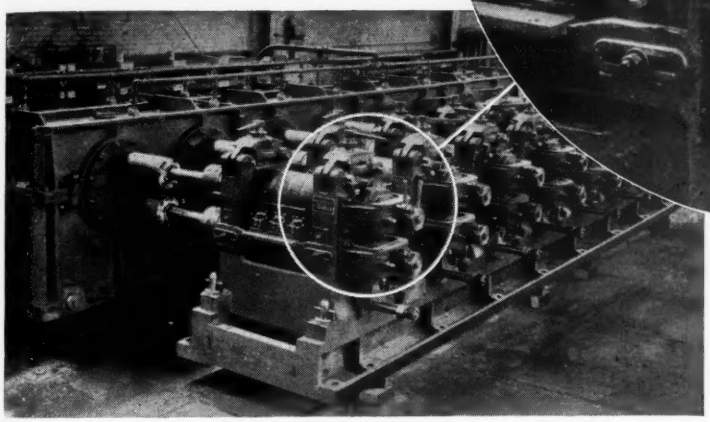
Air Compressor Line Expanded

USE REPLY CARD—CIRCLE No. 10

Ratings of 3 and 5 hp are added to the line of V-type, four-cylinder, two-stage air compressors made by DeVilbiss Co., Toledo O. Compressors are available for either 125 or 175-pound pressure service. Four-cylinder construction reduces amount of heat generated, a problem further controlled by finned cylinder heads,

NEW ROLLER-BEARING END ROLL Reduces Downtime Steps Up Production





End roll adjustment patent applied for.

● The greatest improvement in end roll mechanism made in years . . . permits more accurate and faster end roll adjustment; more flexible operation and minimum maintenance.

The roller bearing is locked to the end of the roll, but may be changed in a jiffy—need not be removed for dressing or until the roll is scrapped. When rolls need changing, patented tilting caps swing up and rolls are raised through top of housing without disassembling end roll adjustment.*

Heavy C clamps secure the bearing housing to the frame with self-aligning surface contact for easy vertical adjustment without wear of clamping surface.

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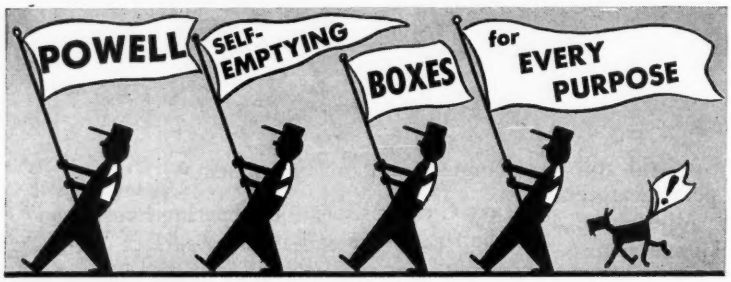

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ORIGINATORS OF COLD FORMED ALL STEEL HANDLING EQUIPMENT

(In Greater Youngstown)

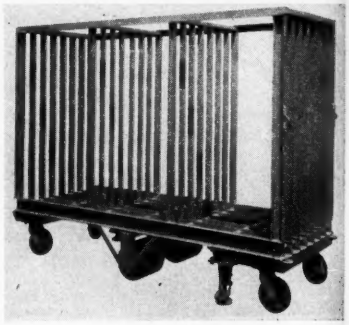
POWELL PRESSED STEEL SINCE 1920

blocks, inter-coolers and check valves plus a fan-type flywheel. All operating parts are counter-balanced to prevent vibration and help assure smooth and quiet operation. Compressor outfits are equipped with automatic pressure switches for starting and stopping the motor at minimum and maximum pressure points.

Sheet Handling Truck

USE REPLY CARD—CIRCLE No. 11

Market Forge Co., Everett, Mass., offers a sheet handling truck with wide spaced rubber wheels suitable for operation over wood-block or concrete floors. Truck gains utility by design that permits its being moved by hand or tractor. Rack has seven



. . . deck rollers ease stock movement

openings, each 4⅜ inches wide. Deck portion is open, fitted with short rollers, on ball bearings, for easy entrance and removal of sheets.

While loading or unloading, floor-locks on both sides keep the truck stationary and in position. Overall dimensions are 3 feet wide, 8 feet long, and 6 feet high. Compartments are 53 inches high and have seven ball bearing rollers in each. Four center wheels fitted with cushion rubber are 10 inches with 5-inch face. Casters on each side have 8 x 2½-inch cushion rubber wheels with roller bearings. Truck's capacity is 6000 pounds.

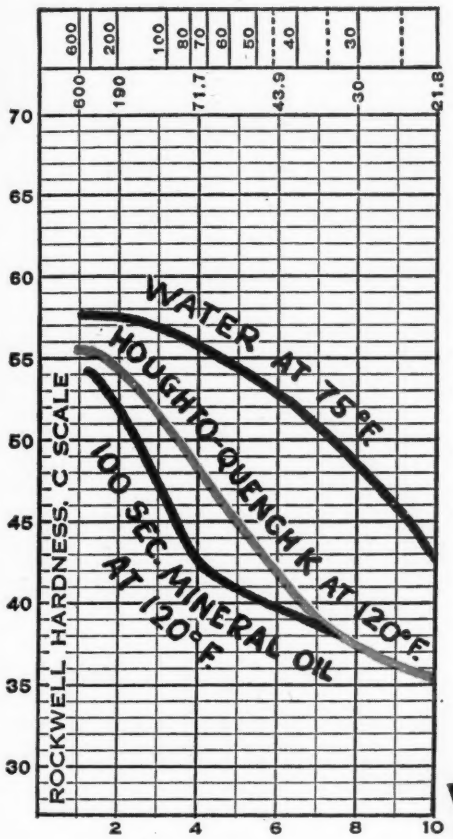
Atmosphere: 150 cu ft per hour

USE REPLY CARD—CIRCLE No. 12

Development of the M-5724-S Atmo-Gen atmosphere generator is announced by Hevi Duty Electric Co., Milwaukee 1, Wis. This unit supplies twice the volume generated by the company's model M-5712-S, offered in 1949. Generator consists of an electric tube type furnace with automatic temperature control, catalyst filled alloy retort and flow regulation accessories. Its ammonia cracker is housed in a fabricated steel cabinet. The unit delivers 150 cu ft of atmos-

Use the Quenching Oil with the "Built-in" Safety Factor . . .
You must be SURE when heat treating lean alloys such as AIRCRAFT STEEL

HOUGHTO-QUENCH "K"



A Jominy comparison of water at 75°F., 100-second mineral oil and Houghto-Quench "K" at 120°F., using AISI 8740 Steel.

Just as steel needs a high safety factor, so does your heat treating procedure. And you get it when you use Houghto-Quench "K", Houghton's brand new treated quenching oil developed specifically to provide speedier quenching of today's lean alloys.

You can be *sure* with Houghto-Quench "K". Its accelerated quenching properties are just what the heat treater must have for steels with hardenability characteristics in the *lower* ranges of the hardenability band.

It gives you that extra measure of safety which government specifications for aircraft steels (MIL-H-6875) demand. It eliminates experiments and costly rejects, because it quenches varying heats with equal dependability. The chart at the left proves the speed of Houghto-Quench "K" compared with water and straight mineral oil quenching.

With today's demands increasing daily for high speed quenching, we have stepped up production of Houghto-Quench "K" to make it more readily available. Write to E. F. Houghton & Co., Philadelphia 33, Pa., for prices and descriptive material.

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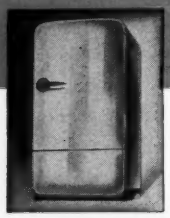
Ready to give you on-the-job service . . .

How ICE CUBES get SQUARE

Has it occurred to you that modern home appliances such as ranges and refrigerators must be provided with leveling adjustments? Floors often are not level; therefore, a special Ⓑ leveling bolt is used under each corner of your refrigerator. These bolts give the housewife level trays of liquids—they assure that the refrigerator door swings properly—and even the ice cubes are always on the square!

THIS SPECIAL Ⓑ LEVELING BOLT

Keeps Everything LEVEL



There's a special job to do and a special Ⓑ bolt does that job. The extremely large head plus the high strength of this rust proof bolt meet the problem. Control from the raw billet to the finished bolt is one reason for quality. Other leveling applications for these bolts are many. They can be furnished with anti-skid or smooth surfaces; with shoulder for wrench adjusting, or made to suit your particular specifications. We'll gladly help you "keep it on the level."

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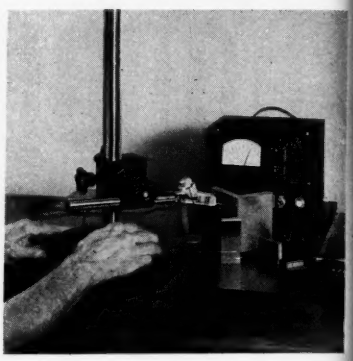
phere per hour for the following heat treating operations: Clean non-decarburized hardening, dry cyaniding or carbonitriding, carburizing (carrier gas), copper and silver brazing, nitriding, sintering, bright annealing.

Indicator Checks Setup, Runout

USE REPLY CARD—CIRCLE No. 13

Electronic indicator, the Indi-Ac, made by Graham-Mintel Instrument Co., 735 Carnegie Ave., Cleveland 15, O., is a portable precision instrument for checking machine setups and runout. Application can also be made for surface-plate work in shops, tool and gage rooms. Instrument has an induction gage head, adjustably mounted on a stand, and a high-sta-



. . . gage head has frictionless movement

bility four-tube amplifier with two-scale meter. Gage head has frictionless movement, with no mechanical amplification. Amplifier is free from drift and readings are unaffected by ordinary temperature changes of gage head or line voltage fluctuations. Meter's two continuous linear scales read 0.0005 and 0.00005-inch or 0.0001 and 0.00001-inch per division, either side of zero. Scales can be used interchangeably.

Sealer Closes Wide Material

USE REPLY CARD—CIRCLE No. 14

For final manufacture and closure of large containers made of heat-sealing materials, Pack-Rite Machines, 714 W. Wisconsin Ave., Milwaukee 1, Wis., announces its 38-inch Jumbo Jaw heat sealer. Unit has sealing bar 38 inches long to close 36-inch standard width material. Movable jaw operates by a compressed air thrust cylinder arranged with an air regulator valve. This setup provides any desired sealing pressure from 19 to 31.5 psi over the entire 38-inch bar and assures seals made at uniform pressure. Sealer operates on air from 60 to 100

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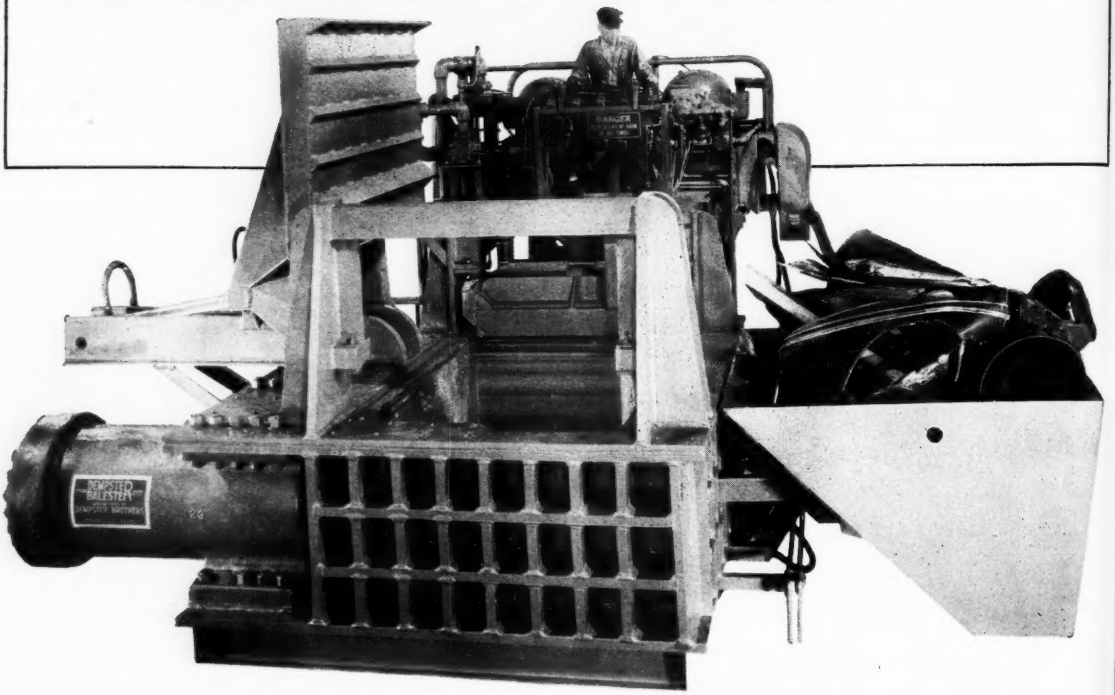
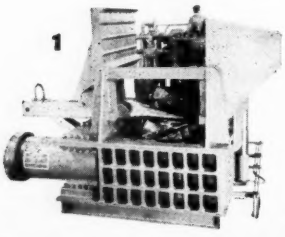
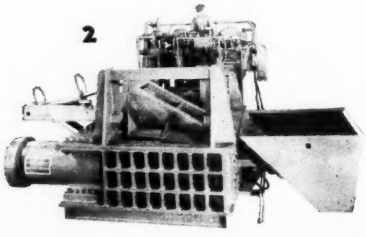
You Can Save Thousands of Dollars In Installation Cost Alone With the Big Capacity Dempster-Balester "600"

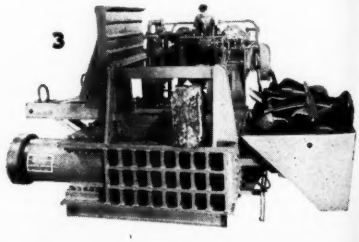


Installation expense of a big capacity scrap metal baling press need no longer be a costly item running into several thousand dollars. On the Dempster-Balester "600" all hydraulic assemblies are integral to the machine itself. The "600" is self-contained, requiring no air compressors, springs, counter-weights or supplementary equipment for its operation. Therefore, only a simple foundation and small pit for ejector are required. In many cases, the "600" has been assembled and in operation in three to four days after arrival. This mighty "600" turns out high density 16"x18"x35" bales at the rate of 6 to 7½ tons per hour. This rate is increased by a conservative 25% with Auxiliary Compression Door.

Photos below show the complete baling cycle of the Dempster-Balester "600" with Auxiliary Compression Door . . . offering you the nearest thing available to automatic baling! 1—Skip Pan dumps scrap metal into charging box. 2—Compression Door compresses scrap with a 45-ton force plus the 4500 pound weight of the door and Skip Pan returns for reloading. 3—Compression Door returns to up-right position while scrap is baled. Then finished bale, weighing between 600 and 1,000 lbs., is ejected. Write today to Dempster Brothers, Inc. for folders on the complete line of Dempster-Balester Presses!







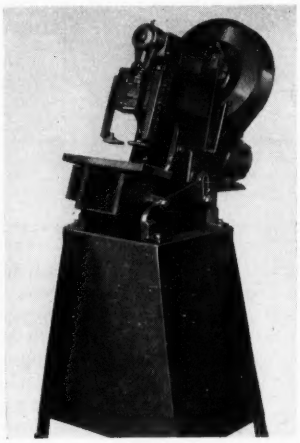
DEMPSTER BROTHERS. 6121 Dempster Bldg., Knoxville 17, Tenn.

pounds. Electric timer regulates dwell time from 0 to 30 seconds. Each bar has two 375 w brass sheathed heating elements, thermostatically controlled over a range from 0 to 500° F.

Punch Press Tilts 25 Degrees

USE REPLY CARD—CIRCLE No. 15

Whitney Metal Tool Co., Rockford, Ill., offers No. 127 punch press, an open back machine that can be tilted a maximum 25 degrees. Location of flywheel to the rear rather than the side gives it a clear, out-of-the-way position providing greater safety and



. . . rates 275 one-inch strokes per minute

more clearance for feeding stock. Speed is rated at 275 strokes per minute; capacity is 5 tons. Positive non-repeat clutch can be released for automatic feed. Throat depth is 6 inches; throat height, 7 inches; length of stroke is 1 inch; and stroke adjustment is 1¼ inches. Die space is 5¾ inches, with stroke down and adjustment up. Both floor and bench models are available.

Portable Cutter Trims, Shapes

USE REPLY CARD—CIRCLE No. 16

High-speed portable cutter that erases need for transporting work to stationary machines is introduced by Composite Die Supply Co., 14310 Birwood, Detroit 4, Mich. Machine operates as a portable milling machine—planer — router combination. Among its applications are listed cutting and shaping of nonferrous metals and alloys, plastics, etc. Called the Handshaper, the contour cutter is sufficiently simple in operation to be handled by unskilled personnel. Machine cuts in two directions, following concave or convex lines at the same time it is moved up or down. Its one cutting head and

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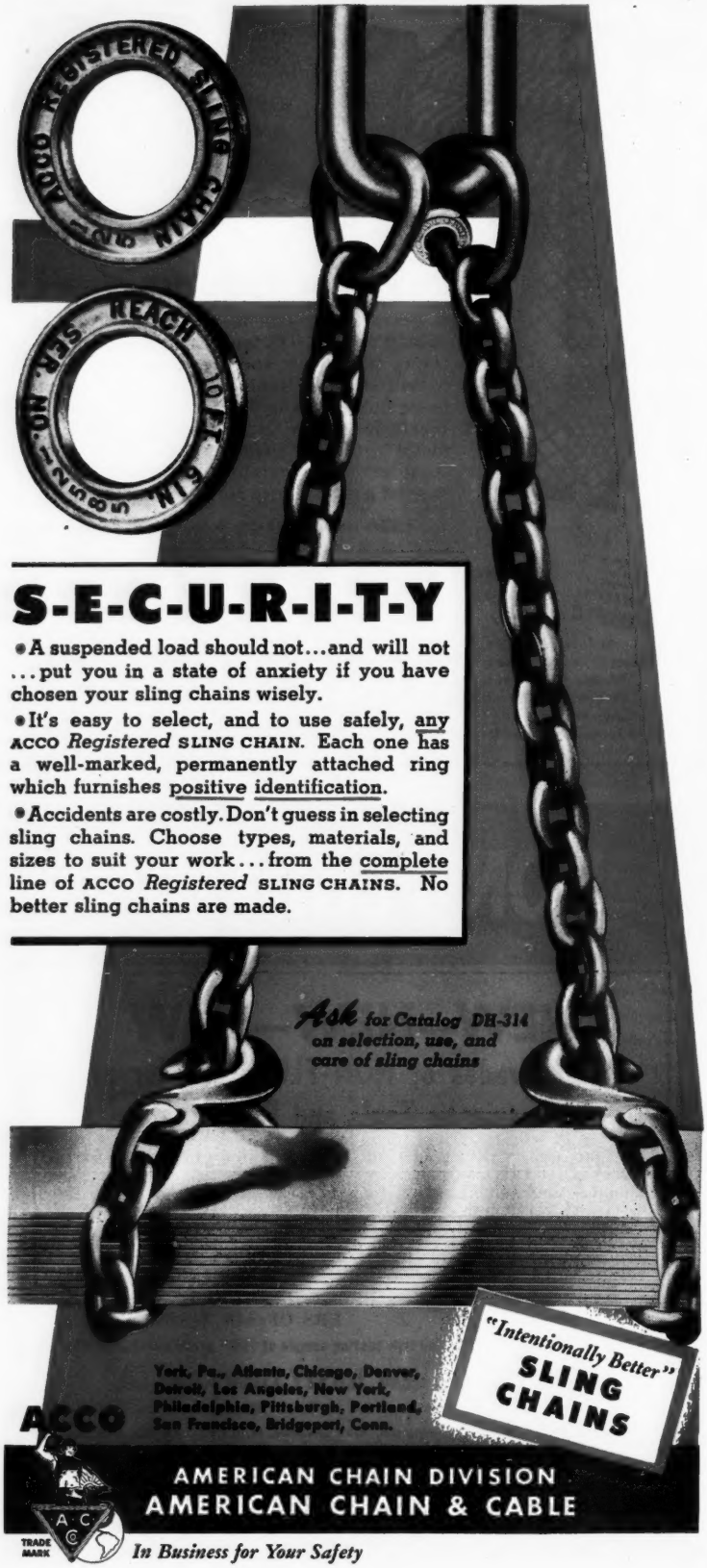
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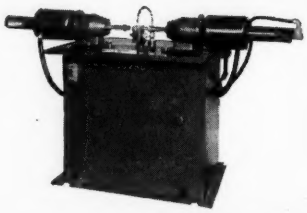
two high speed adjustable cutting blades are powered by 60 cycle, 115 v dc motor, operating at 18,000 rpm.

Machine Drills, Counterbores

USE REPLY CARD—CIRCLE No. 17

Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich., offers its model HH machine for automatic opposed sequence operation. Machine incorporates two model HH units wired for drilling and counterboring in sequence. In operation, small steel part is loaded into the fixture where one unit drills No. 44 hole and No. 30



. . . operates in automatic opposed sequence

counterbore with a combination tool. When this operation is complete, the second unit works from the opposite side to ream part way a No. 38 hole 0.004-inch off center line established by the first drilling and counterboring operation. Variation in unit's position and tools employed permit adaption to other drilling operations.

Pump Handles Small Quantities

USE REPLY CARD—CIRCLE No. 18

Submersible pump, the Subette, designed for small capacities at high heads from wells 6 inches ID or larger is offered by Byron Jackson Co., Box 2017, Terminal Annex, Los Angeles 54, Calif. Pump's capacity range is 30 to 130 gallons per minute at heads of 80 to 770 feet. Motors are 3-phase, 60 cycle, 220-440 v, at 3500 rpm and are available in sizes of 5, 7½, 10 and 15 hp. All motors are oil-filled, mechanically-sealed, capable of operating completely submerged in water.

Machine Is Parts Cleaner

USE REPLY CARD—CIRCLE No. 19

Batches of parts can be cleaned by solvent and alkali solution in the Aja-Lif machine offered by Magnus Chemical Co. Inc., Garwood, N. J. Machine also can be used for quenching, wax coating and protective coating metal parts. Work is done by connection with the plant air compressor, using no electric motor in its air powered operation. Tank platform is operated by a single lever that controls movement of parts. Lever op-

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"EASIEST of all Shears to operate" are not just our words. They are words of operators in plants throughout the country.

Men who have worked for many years on shears of various makes and know them through and through are acclaiming the many features incorporated into Steelwelds—features that ease their work, speed production and make for greater accuracy and minimum maintenance.

Steelweld Shears are entirely new machines designed from scratch as such. They are not a variation of or an adaptation to any previously existing machine. The designers of these new shears were free to incorporate all ideas and features that would result in better machines. They were not hampered by tradition or previous designs or models.

As a result, Steelweld Shears are radically different with advantages never before possible.

Whether or not you are in need of a shear at this time, if you work plate in any thickness up to 1 inch or length to 18 feet, we urge you to get more data on these modern machines. Keep informed—send for the catalog below.

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CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

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STEELWELD PIVOTED BLADE SHEARS

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Even the keenest, eagle-eyed inspectors cannot see invisible surface cracks, nor below the surface of metal. But Magnaflux can! Magnaflux instantly spots invisible cracks—*on the surface or under it!*

Magnaflux is low in cost, nondestructive—*and so fast that it performs at production line speed!* That's why so many quality-conscious manufacturers depend on Magnaflux, not only to cut production costs, but to assure that the products *you* buy will deliver safe, satisfactory performance—from washing machines to refrigerators, from aircraft to machine tools!

For detailed information of how Magnaflux saves money and lives, write for literature, sent on request without obligation.

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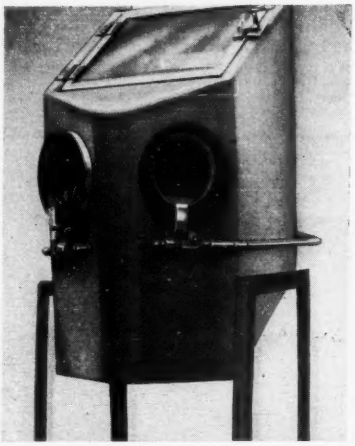
eration brings platform to the tank's top, out of the liquid for inspection, loading and unloading. Machines are available in capacities of 95, 200 and 300 gallons.

Bench Model Wet-Blaster

USE REPLY CARD—CIRCLE No. 20

Bench model wet blasting unit, called Pressure-Blast Jr., is offered by Cro-Plate Co. Inc., 747 Windsor St., Hartford 5, Conn. Improvements made on the unit permit elimination of the pump function by replacing it with siphoning action of the compressed air operated jet gun. Used



. . . replaces pump with air siphoning gun

for deburring, descaling and general surface cleaning, the blaster requires one ⅜-inch water connection and one ⅜-inch air connection on standard shop pressure. For blower operation and lighting, a single 110 v line is used. Stainless steel construction with sweat copper plumbing indicates high corrosion resistance and long life. It uses any abrasive from 75 to 5000 mesh.

Converging Section

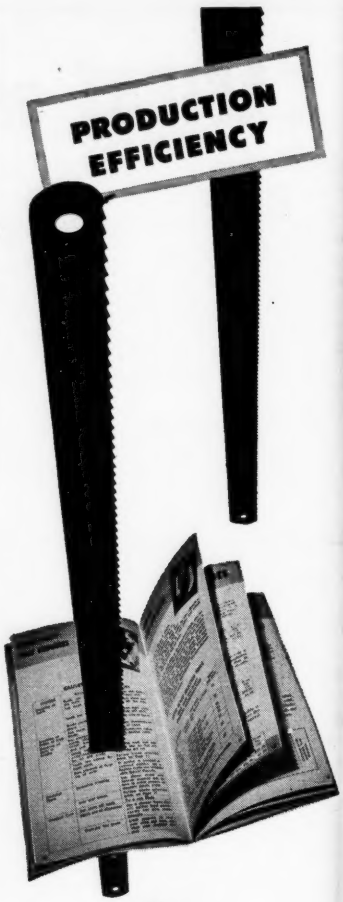
USE REPLY CARD—CIRCLE No. 21

Sage Equipment Co., Buffalo 13, N. Y., offers a converging section that is available for all width roller conveyors from 6 to 36 inches wide. The Convergo is used where it is necessary to have two lines converge into one or one line branch into two.

Melts Snow and Ice

USE REPLY CARD—CIRCLE No. 22

Thermwire, a flexible electric heating cable, introduced by Edwin L. Wiegand Co., Pittsburgh 8, Pa., consists of a heavy-gage nickel chromium resistor wire with tough abrasion resistant insulating sheath. Unit protects roofs, gutters and down-



the easy way

Here's how to get efficient metal-cutting the *easy* way: Tell your supplier you want VICTOR hand and power hacksaw blades and flexible-back band saws, the brand most people buy.

Then ask him for a supply of VICTOR Metal-cutting Booklets – full of timely authoritative information on the selection, use and care of *any* blades, full of handy hints on fast, efficient metal-cutting.

That's all there is to getting metal-cutting efficiency the easy way.

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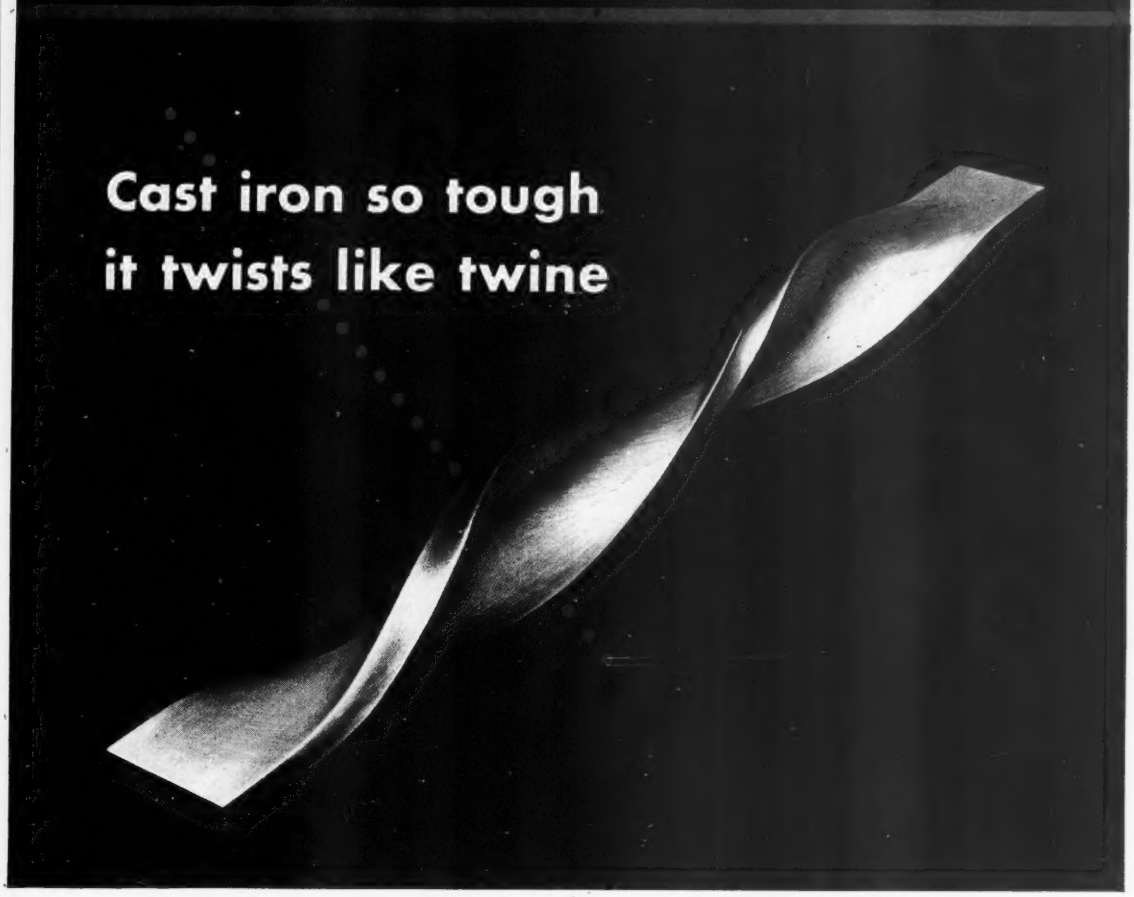
SAW WORKS, INC. • MIDDLETOWN, N.Y., U.S.A.
Makers of Hand and Power Hack Saw Blades, Frames and Metal Cutting Band Saw Blades

ANOTHER AMERICAN Brake Shoe COMPANY PRODUCT THAT CUTS THE COST OF WEAR



Ductile Iron—A New Metal . . . Offers New Possibilities To Industry!

Unlike many irons, you can bend it, twist it, hit it or heat it and it stands up. Ductile iron is tough. It is stronger than mild steel. This remarkable metal possesses the desirable qualities of cast iron together with many of the advantages of steel. It frequently replaces steel in applications, such as gears, crankshafts, pressure castings, dies and pipe at a lower cost.

Ductile iron may be cast in large or small castings in intricate shapes that are difficult or impossible to cast in steel. It can be cast with a fine surface and to close tolerances. It can have the unique property of combining a chilled surface with a tough ductile core which gives it excellent abrasion resistance and considerable shock resistance. It can be welded to iron, or steel in a strong, tough bond. It has good machinability.

The potential uses of ductile iron are nearly endless because it combines a wide range of properties with a competitive cost. Our engineers will be glad to work with you in finding how ductile iron may be applied to your problem. Write Department G, American Brake Shoe Co., 230 Park Avenue, New York 17, N. Y. for literature on ductile iron.

AMERICAN Brake Shoe COMPANY
230 PARK AVE., NEW YORK 17, N.Y.

10 Divisions of American Brake Shoe Co. produce wear-resisting parts in 55 American and Canadian plants.
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BRAKE SHOE AND CASTINGS DIVISION • ELECTRO-ALLOYS DIVISION • ENGINEERED CASTINGS DIVISION
KELLOGG DIVISION • NATIONAL BEARING DIVISION • RAMAPO AJAX DIVISION • SOUTHERN WHEEL DIVISION

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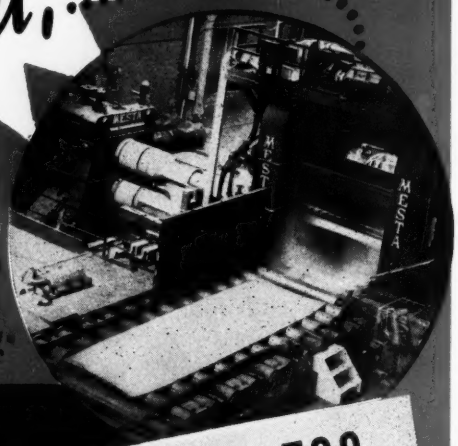
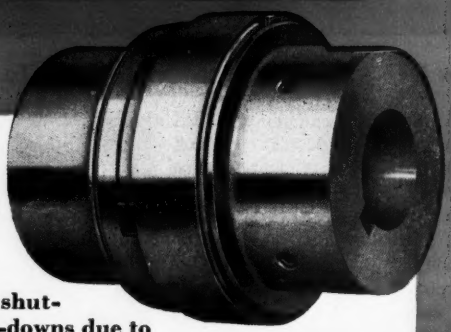
Proved!



"In the Plants of a Large Canadian Steel Producer"

ON RUN-OUT TABLES TOO . . .

LOVEJOY L-R FLEXIBLE COUPLINGS



THREE YEAR MAINTENANCE-FREE SERVICE RECORDS

Eliminate costly shut-downs and break-downs due to coupling failures on run-out tables and other equipment with Lovejoy Flexible Couplings. They are designed to correct mis-alignment without vibration, backlash or surge. Free-floating load cushions are suspended between heavy metal jaws. No shut-downs for changing cushions, which last two to five years. No lubrication ever needed.

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LOVEJOY FLEXIBLE COUPLING CO.

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Also Mfrs. Lovejoy Universal Joints and Lovejoy Variable Speed Transmissions

spouts from dangerous accumulations of snow and ice. Embedded in asphalt or concrete, it melts ice from doorways, steps, driveways and other pavements.

Lubricant for Gages

USE REPLY CARD—CIRCLE No. 23

Improved Micronoil Gage-Lube, available from Protective Coatings Inc., Detroit 27, Mich., is said to extend use-life of precision gages and other close tolerance surfaces. There is no dimensional change as film measures a maximum of 20-millionths inch. Lubricant is nongumming, nonloading and nonfreezing. It is immune to pickup of soft metals and does not damage screw threads in soft metal parts.

Starters with Indicating Light

USE REPLY CARD—CIRCLE No. 24

NEMA size 0 and 1 manual motor starters with built in indicating lights are offered by Westinghouse Electric Corp., Pittsburgh 30, Pa. They are mounted in NEMA type I enclosures. Indicating light is generally used to show whether starter is on or off, but it can be wired into circuit to indicate other conditions.

Abrasive Refill Cartridges

USE REPLY CARD—CIRCLE No. 25

Merit Products Inc., Culver City, Calif., offers scored abrasive refill cartridges for use with their Sand-O-Flex brush-backed contour sanders. They are made up of several strips of abrasive wound around a central core and are loaded in less than a minute. Strips unwind and are backed by brushes which cushion the abrasive forcing it over intricate shapes. Cartridges are available in garnet and aluminum oxide cloth.

Stainless Steel Coating

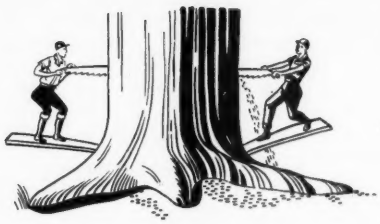
USE REPLY CARD—CIRCLE No. 26

Steelcote Mfg. Co., St. Louis, Mo., announces a stainless steel coating for all metal surfaces that is applied by brush or spray gun. It protects surface against rust, corrosion and other types of deterioration caused by salt air and water, industrial atmospheres, alkalis, oils, greases, most strong acids, heat, cold and sunlight.

Wheel Dressing Tools

USE REPLY CARD—CIRCLE No. 27

Two wheel dressing tools are introduced by Christensen Diamond Tool Co., Detroit 13, Mich. Group-mounted dressing tools are recommended for large outside diameter, straight-face applications where high finish is required. Each tool contains five, six



Lumber Company proves Metal Workers right

...“it takes a TOUGH Conveyor Belt to haul a tough load!!!”

Mounting labor costs and shortages of local workers caused a large Southern Lumber Company to install conveyor belts for unloading lumber.

The idea worked fine. Several carloads could be unloaded simultaneously on the belts with minimum effort, handling costs were reduced and a confused traffic situation was eased.

But, ordinary conveyor belts couldn't stand the pace! Rough oak planks gouged off sections of belt covers and weather made deep inroads through the cuts, causing carcass deterioration and premature belt failures.

A local Republic Distributor, called in for advice, quickly solved the problem by recommending use of Republic Record Maker—a conveyor belt with tough rubber exterior and a rugged, mildew-resistant carcass . . . a belt widely used in the metal working industries.

Today, 4 years later, the job's still going smoothly! Raw lumber rolls steadily into the mill on Record Maker Belting. There have been no work stoppages due to belt failures, and company officials claim the operation is now 4 times more efficient than it was when ordinary belts were used.

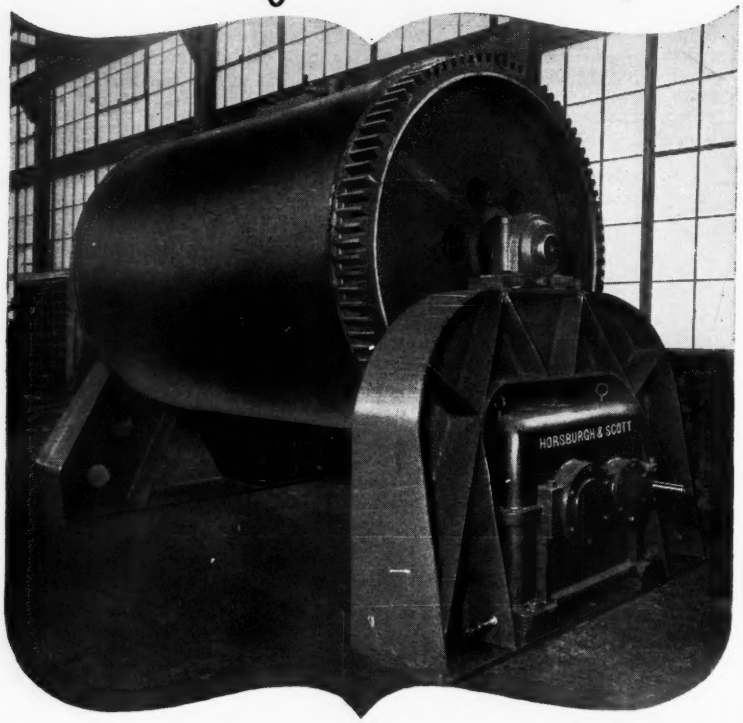
You'll achieve similar success with Industrial Rubber Products only if the products are properly applied to the job. Take advantage of Republic Rubber's free service offering to have a complete analysis made of your requirements. Write us today. Whether it's Conveyor Belting, Transmission Belting, Hose or Packing—there's no substitute for the best!

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

H & S SPEED REDUCERS

save maintenance and space with

Greater safety



• Since 1940 the Horsburgh & Scott Herringbone Speed Reducer illustrated above...driving an Epworth Manufacturing Company Ball Mill in a large paint manufacturing plant... has been in operation with *no* repairs necessary. The service is severe with heavy starting load and the machine operates continuously for periods of 24 to 72 hours. As compared with the old drives the results are: greatly reduced maintenance and space... greater safety is also an important feature. H & S Speed Reducers offer many savings and advantages throughout the range of industry...it will pay you to investigate.

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GEARS AND SPEED REDUCERS

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Send note on Company Letterhead for Speed Reducer Catalog 46

or seven diamonds arranged so that three to five points are in contact with work at all times. Chisel-face tools have two or three diamonds mounted in a straight line and are primarily intended for large-diameter, wide-face dressing applications.

Die Shop Reamer Sets

USE REPLY CARD—CIRCLE No. 28

A line of die shop reamer sets is introduced by Lavallee & Ide Inc., Chicopee, Mass. They range in size from a set of 11 helical diemakers reamers No. 1 through No. 11, to a set of wire gage chucking reamers No. 1 through No. 60. Sizes through 5/16-inch are ground from the solid.

Tang Break-Off Tools

USE REPLY CARD—CIRCLE No. 29

For removal of inserting tangs on helical wire thread inserts, a line of automatic tang break-off tools is offered by Heli-Coil Corp., Danbury, Conn. Operating on the principle of spring-loaded center punch, these tools remove tangs without disturbing inserts.

Miniature Panel Mount Switch

USE REPLY CARD—CIRCLE No. 30

Model MP Tyniswitch, developed by Sessions Clock Co., Forestville, Conn., is a miniature panel mount type measuring only 1⅝ x 7/16 x ¾-inch. It provides precision snap action, long life and high rating at low cost. It may be used as a switching component for equipment where available mounting space is limited.

Heavy Duty Power Take-Off

USE REPLY CARD—CIRCLE No. 31

Known as P-80, a packaged heavy duty take-off to fit all standard motor trucks is announced by Davey Compressor Co., Kent, O. A vacuum shift control is offered as optional equipment.

Starters for Arc Welders

USE REPLY CARD—CIRCLE No. 32

General Electric Co., Schenectady 5, N. Y., is using a new type starter, basically a fused high capacity in-

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Helpful Literature

74. Sheet Metal Cutting

American Pullmax Co.—Method and type of cutting, beading and joggling performed by line of Pullmax sheet steel and plate cutting machinery is illustrated and described in 8-page brochure. With the right tools and attachments, machines will do straight, circle, freehand, slot and louver cutting as well as nibbling. Eight models are shown.

75. Antirust Paint

Monroe Co.—Rust-Cure antirust paint which can be applied on rusted surfaces without wire-brushing, scraping or sandblasting is subject of illustrated application sheet No. 136-11. Paint seals rusted surfaces and retards further rust action. It is available in black, aluminum and clear for brush, dip or spray application.

76. Pipe & Bar Machine

Medart Co.—Operation of the two-roll continuous, automatic straightening, sizing and polishing machines is outlined in 2-page data sheet 51D. This single motor unit is offered in ten different sizes for tubing, pipe and solid bars ranging in diameter from ⅛ to 10 in. Throughput speeds range up to 400 lineal feet per minute.

77. Floor Maintenance Machines

Multi-Clean Products, Inc.—Line of Multi-Clean floor machines, all-purpose scrubbers and wet-dry vacuums plus attachments is described, and complete specifications are given in 6-page illustrated folder. Machines perform scrubbing, shampooing, buffing, dry cleaning, waxing, polishing, sanding, grinding and troweling operations.

78. Hardfacing Rod

Victor Equipment Co., Alloy Rod & Metal Div.—Properties of Victorube fabricated hardfacing rod containing 60 per cent tungsten carbide in various mesh sizes and coated for ac-dc applications are covered in 4-page illustrated form No. 321. Data on sizes and applications are included.

79. Stud Welding

Gregory Industries, Inc., Nelson Stud Welding Div.—"How to Design for Nelwelding" is 8-page manual which lists stud specifications and recommended stud selection guides. It also presents suggestions concerning template design, provisions for accommodating fillet and a table on minimum stud clearances.

80. Conveyors & Attachments

Chain Belt Co.—Data on conveying various types of products on slat, drag, vertical and inclined, pusher and extended pin conveyors is included in 12-page illustrated bulletin 50-35. Various types of Baldwin-Rex chains and applications are detailed.

81. Electric Lift Trucks

Yale & Towne Mfg. Co.—Line of electric lift and fork trucks in capacities from 1000 to 100,000 lb is described and selection aid table presented in 12-page illustrated bulletin P5151.

82. Ultrasonic Testing

Sperry Products, Inc.—The Reflectoscope and Reflectogage ultrasonic testing devices which locate fatigue cracks and other flaws in metal and other material as far as 40 ft from test surface are discussed in illustrated bulletin 50-115. Booklet also describes company's commercial testing services offered to industries not having testing equipment.

83. Industrial Power Trucks

Baker-Raulang Co., Baker Industrial Truck Div.—Illustrated 2-page report No. 243 is one of a series of case studies on uses of power fork trucks. Report shows how plant increased its storage capacity more than 200 per cent by high tiering, and reduced handling manhours from 48 to 1½ on one handling step.

84. Rust Preventive

Nox-Rust Chemical Corp.—Wall chart No. 451 measuring 17 x 22 in. lists uses, minimum protection time, application and removal, physical description and miscellaneous data of Nox-Rust compounds used as protective coatings for metal parts and machinery. Those meeting Federal and military specifications are presented.

85. Controlled Volume Pumps

Milton Roy Co.—Standard motor-driven controlled volume pumps for handling any liquid, from heavy viscous kinds to light solvents, solids in suspension, abrasive slurries, and liquefied gases, are subject of 24-page illustrated bulletin No. 251. How pump capacity can be regulated by plunger speed and stroke adjustments is also detailed.

86. Recording Oscillograph

Century Geophysical Corp.—Operating features of model 409 recording oscillograph for 12-trace recording on paper or film are detailed in 2-page illustrated data sheet CGC-303.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

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HELPFUL LITERATURE

87. Conveyor Belts

Raybestos-Manhattan, Inc., Manhattan Rubber Div.—Ray-Man F general purpose heavy duty conveyor belt is described in illustrated bulletin No. 6915. Belt resists tearing or puncture, can be used with small pulleys and is for applications requiring thick, narrow belting.

88. Condenser Tubes & Plates

American Brass Co.—48-page illustrated B-2 manual "Anaconda Tubes and Plates for Condensers and Heat Exchangers" is written for engineers responsible for selection of materials in the marine, oil refinery and stationary steam power plants. It discusses the application and installation of condenser and heat exchanger tubes as well as tube sheets, heads and baffles.

89. Filters

Sparkler Mfg. Co. — Horizontal plate principle of filtration, used in line of filters for all liquids, is described in 4-page illustrated data sheet No. 65125M. Advantages of principle, construction details, applications and specifications are included for various models.

90. Pipe Line Strainers

J. A. Zurn Mfg. Co.—16-page illustrated "Pipe Line Strainer Data Manual" No. 951 contains information on several types of all-purpose strainers ranging in sizes from ½ to 36 in. Some are designed for continuous production processes. Aid in selecting type and size strainer, and the effect of flow rate, screen loading and viscosity of fluid on pressure drop are covered.

91. Flexible Plastic Tubing

U. S. Stoneware Co.—24-page illustrated brochure T-77 discusses six standard extrusion formulations for Tygon flexible plastic tubing. Comparative properties and chemical-resistant characteristics are tabulated. Applications for laboratory, food, chemical and industrial uses are described.

92. Alloy Steels

Wheelock, Lovejoy & Co.—32-page pamphlet entitled "Alloy Steels" is application guide covering quality, heat treatment, physical properties and common uses of Hy-Ten AISI and SAE alloy steels. Data are tabulated for quick reference.

93. Motor Starters

Arrow-Hart & Hegeman Electric Co.—Full description and illustration including dimensions, weights and ratings for RAS and RAR multispeed and reversing magnetic motor starters is presented in 8-page folder. Capacities range from 1 hp at 110 v to 100 hp at 440-550 v.

94. Axle Assemblies & Parts

United Mfg. Co.—Line of Caravan axle assemblies, component parts and accessories is described and illustrated in 12-page catalog No. 101. Two and four-wheel assemblies are for mounting generators, pumps, concrete mixers, etc.

95. Low-Pressure Cells

Baldwin-Lima-Hamilton Corp. — Illustration, wiring and dimensional diagrams and specifications pertinent to SR-4 low-pressure cells of 0-10 to 0.100 psi capacity for measuring fluid pressure variations are given in 2-page bulletin 326.

96. Gas Generator

Westinghouse Electric Corp.—Applications of combination Exogas generator and Co_2 removal system are described, and construction details and dimensions of combined unit are provided in 8-page illustrated bulletin DB-28-825.

97. Press Brakes & Dies

Airtherm Mfg. Co., Machinery Div. —Complete information and specifications on 1500 and 2000 series steel power press brakes and steel forming dies are included in 12-page illustrated catalog 907. Metalworker presses have bed widths ranging from 48 to 120 in. and capacities for handling from 18-gage through 3/16-in. mild steel.

98. Hardfacing Products

American Brake Shoe Co., American Manganese Steel Div.—Guidance in the selection of Amsco hardfacing products in all fields is provided by 4-page illustrated bulletin SG which tabulates recommended rods, sizes and methods of application.

99. Totally-Enclosed Motors

Allis-Chalmers Mfg. Co.—"Totally-Enclosed Fan-Cooled and Non-Ventilated Motors" is title of 6-page illustrated folder 51B7225 which describes construction features of these motors. They are offered in ratings ranging from ½ to 100 hp.

100. Steel Tubing

Brainard Steel Co.—"Welded Mechanical and Structural Steel Tubing" is title of 8-page illustrated bulletin which covers manufacture, fabrication and typical applications of tubing. Tables give weight per linear foot, size tolerances and gage tolerances for various sizes of cold and hot rolled mechanical tubing.

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terrupter switch, on all production models of type WD-42, 43 and 44 motor generator direct current arc welders. It provides positive motor starting because contacts are locked in by mechanical action. A direct acting lever physically closes or opens the contact when it is operated, affording direct control over starting and stopping.

Knee-Action Caster

USE REPLY CARD—CIRCLE No. 33

Clark Duoflex knee-action caster, available from All Steel Welded Truck Co., Rockford, Ill., is designed to give maximum protection to fragile loads due to a 2-inch vertical wheel motion when obstructions are met. Both swivel and rigid types are made in wheel sizes from 6 to 20 inches in diameter.

Remote Control Jack

USE REPLY CARD—CIRCLE No. 34

BeeLine Co., Davenport, Iowa, offers a 100-ton remote control jack. It provides maximum power for heavy duty automotive and construction work. It is of modern design and minimum weight with collapsible twin handles for easier positioning. Remote control makes it easy to use where working space is limited.

Lifts 30 Feet High

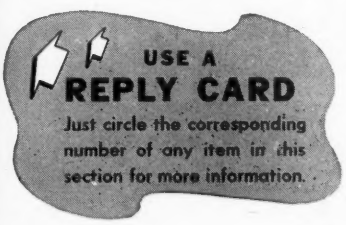
USE REPLY CARD—CIRCLE No. 35

Longlift, announced by Lug-All Co., Wynnewood, Pa., will lift pipes, motors, ducting, unit heaters or construction equipment to heights of 30 feet when used with an 8½-pound hoist. It can also be used for pulling up broken overhead conveyor chains.

Carbide Tipped Saw

USE REPLY CARD—CIRCLE No. 36

Gay-Lee Co., Clawson, Mich., offers a carbide tipped Thinsaw for precision slitting. It is available in thicknesses down to 0.030-inch with tolerance held to 0.0002-inch and in diameters up to 5 inches. Saws include solid carbides with steel brazed hubs in all special dimensions from 0.250-inch diameter up.



for CONTINUOUS ELECTRIC POWER

Diesel-Electric Locomotives

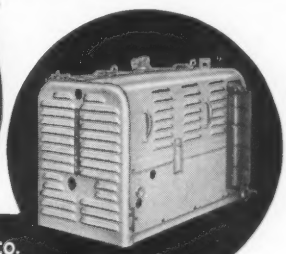
READY-POWER-equipped ELECTRIC-TRUCKS

Loading a Box-car with Ready-Power Equipped Elwell-Parker Hi-Lift Platform Truck

Modern Diesel-electric locomotives and Ready-Power-equipped electric trucks operate alike. Both generate dependable electric power right on the vehicle; both operate economically; and both excel where long, continuous operation pays off. Your electric trucks will do more work at less cost when equipped with Ready-Power. There are models for every type, size and make of electric truck.

Yale Crane Truck Equipped with Ready Power

Ready-Power-Equipped Automatic Fork Truck



THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

Season's Greetings
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SURE SPEC
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The Market Outlook

SEASONAL influences will take some of the pressure off the steel mills over coming weeks as year-end approaches. Holiday curtailments promise to add somewhat to the current easing in some areas of manufacturing industry stemming from shutdowns attending cutbacks in steel and nonferrous metal allotments to civilian durable goods makers. But the respite promises to be shortlived. Indications are the slack attending the slowing down of demand on civilian durable goods account gradually will be more than offset by requirements for defense. First quarter supply conditions are expected to show little change from those of recent months, with overall demand continuing to outstrip production.

SUPPLY—Despite further cuts in supplies to civilian goods industries, supply-demand balance in steel still is months distant. Actually, most trade authorities anticipate no noticeable change in market conditions before mid-1952 at earliest, with easing then depending upon maintenance of steel production at top speed through the winter months. This means output curtailments due to labor trouble and scrap shortage, which now threaten, must be averted. That tight control of steel supplies will be maintained by the government indefinitely into the future is certain despite fears in some steel trade circles of surplus supplies in the not distant future as result of unrealistic government controls. Last week, machine tool builders were given a stronger priority label, Z-2, placing them on a par with atomic energy and military programs in obtaining materials.

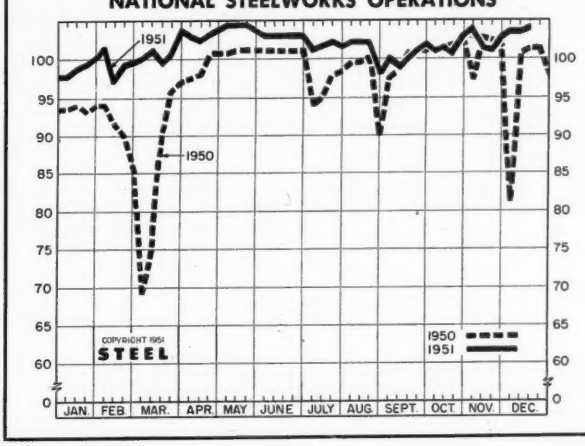
PRODUCTS—There will be substantial tonnage carryover in most products into first quarter next year. To what extent these will necessitate changes in schedules is uncertain. Currently, producers are heavily booked for first quarter, and are beginning to open their books for second quarter tonnage. Overall pressure for sheets is easier with scattered cancellations of orders reflecting cutbacks in civilian goods. Some of the slack in sheets will be taken up by diversion of additional rolling time on continuous mills to production of light plate. There is no indication the supply of bars will match demand any time soon. Currently there is not enough hot-topped steel to go around and demand is increasing. This type of steel is required in production of cold-finished bars needed in the manufacture of shells and shell components, nuts, bolts, screws, shafts and other parts required for machine tools and other products. Structural steel will be in tight supply through most of 1952. Government officials last week advised representatives of 43 states that structural allotments for public roads, schools and hospitals can't be increased before fourth quarter.

PRODUCTION—Output of steel ingots passed the 100 million-ton mark last week, the first time in history such tonnage has been produced in any one year. With more than two weeks yet to go indications are total steel output for the year will come out around 105,145,000 net tons. The previous all-time high record was set in 1950 when 96,836,075 tons were produced. Last week the steel mills boosted operations ½ point, the national ingot rate rising to 104 per cent of capacity.

SCRAP—Despite the government drive, winter shortage of scrap still threatens. Favorable weather over the past several weeks stimulated the flow of material but the mills are doing little more than holding their own with respect to inventories. Normally, scrap shipments decline about 35 per cent during the winter because of transportation and preparation difficulties. Consequently, unless supplies can be built up before severe weather sets in production difficulties are certain to be encountered. In another move to bring scrap to the market quickly, the National Production Authority issued an inventory control order which is expected to flush out 2 million tons from auto wreckers in the next three months.

PRICES—With the exception of revisions in warehouse price schedules as result of the new OPS regulation effective Dec. 16, no changes in steel and related product prices are reported.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Dec. 15	Change	Same Week 1950	Same Week 1949
Pittsburgh	100.5	+ 0.5*	103	96
Chicago	106.5	— 1*	96	97.5
Mid-Atlantic	101.5	0	100	83
Youngstown	106	0	104	95
Wheeling	102	+ 2.5	100	99
Cleveland	112.5	+ 6.5*	101	98
Buffalo	104	0	104	103.5
Birmingham	105	+ 1	100	100
New England	77	—15	90	85
Cincinnati	102	0	102	104
St. Louis	82	—11.5	86	89.5
Detroit	108	+ 2*	106	107
Western	98	— 7	105	91
Estimated national rate	104	+ 0.5	101.5	94.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 53 Production-Engineering News—p. 89

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Dec. 13 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)..	171.92	171.92	171.92	167.67	112.04
Index in cents per lb.	4.657	4.657	4.657	4.545	3.035

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32	$106.32	$106.32	$103.50	$64.73
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	30.17
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	29.56
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	30.79
Steelmaking Scrap, GT	43.00	43.00	43.00	45.50	24.25

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Dec. 13 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.18	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.10
Shapes, Std., Pittsburgh...	3.65	3.65	3.65	3.65	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.35
Shapes, del. Philadelphia...	3.918	3.918	3.918	3.90	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.50
Plates, Chicago	3.70	3.70	3.70	3.70	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	4.15	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.50
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh...	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.41
Sheets, Galv., Pittsburgh...	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh.....	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.25	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.50-4.90	3.20
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.385
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.05
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	3.75
Tin plate, box, Pittsburgh..	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$47.00
Wire rods, 7/32-⅜", Pitts....	4.10–30	4.10–30	4.10–30	4.10–30	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$31.00
Basic Valley	52.00	52.00	52.00	52.00	30.00
Basic, del. Phila.	56.61	56.61	56.61	56.39	31.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Del. Phila....	57.11	57.11	57.11	56.89	32.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	26.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.58	30.94
Malleable Valley	52.50	52.50	52.50	52.50	30.50
Malleable, Chicago	52.50	52.50	52.50	52.50	30.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	37.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts. ..	$44.00	$44.00	$44.00	$46.50	$25.00
No. 1 Heavy Melt. E. Pa...	42.50	42.50	42.50	45.00	24.00
No. 1 Heavy Melt. Chicago.	42.50	42.50	42.50	45.00	25.00
No. 1 Heavy Melt. Valley..	44.00	44.00	44.00	46.25	25.00
No. 1 Heavy Melt. Cleve...	43.00	43.00	43.00	45.75	24.50
No. 1 Heavy Melt. Buffalo	43.00	43.00	43.00	49.88	24.25
Rails, Rerolling, Chicago...	52.50	52.50	52.50	67.00	27.25
No. 1 Cast, Chicago.....	49.00*	49.00*	49.00*	63.00	35.00*

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connisvl. ..	$14.75	$14.75	$14.75	$14.75	$8.75
Beehive, Fdry., Connisvl...	17.50	17.50	17.50	16.75	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	19.50
Zinc, E. St. Louis.....	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	11.65
Tin, New York 103.00	103.00	103.00	142.00	70.00	
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ...	50.00	50.00	42.00	32.00	23.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	50.50	38.50

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.00	57.50	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del. ...	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H & Fdry, frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Dec. 13, 1951; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 .....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 .....56.00
Lackawanna,N.Y., B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer, Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 .....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14 .66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 .....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ...4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 .....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11..4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Wercester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

STRUCTURALS
Carbon Steel Stand., Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 .....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y-1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ...3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ...5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ...5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ...4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.95
Ashland,lcl(15) A10 ....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif. (30) K1 .4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ...3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....3.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ...4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ...3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12, R2..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A 7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13 .4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3 ..5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa. (3,4) F5 ..4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover,(Wrgh.Iron) U1..12.25
Economy,Pa. (S.R.) B14.9.60
Economy,Pa. (D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ...4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ...4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1..3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 .3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R., (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint (36) B2..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy.
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvannealed No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt, B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10)	S15 5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base.	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2,	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35
Midland,Pa. C18	5.85				
NewBritn,Conn.(10)	S15 5.45				
Sharon,Pa. S3	5.85				
Youngstown U5	5.50				

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10)	S15 5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Frtez-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn. (10)	$15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland	A7 .....10.00
Dover, O.	G6 .....10.50
Fontana,Calif.	K1 ...11.65
Harrison,N.J.	C18 ....10.60
Midland,Pa.	..C18 ....10.60
NewBritn,Conn. (10)	S15 10.75
Pawtucket,R.I. (11)	N8.10.75
Pawtucket,R.I. (12)	N8..11.05
Sharon,Pa.	S3 .....10.60
Worcester,Mass.	A7 ..10.30
Youngstown	C8 ..... 10.60

STRIP, Hot-Rolled Ingot Iron

Asland,Ky. (8)	A10 ..3.75
Warren,O.	R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 .....4.05
Riverdale,Ill.	A1 .....3.90
Sharon,Pa.	S3 .....4.15
Youngstown	U5 .....3.75

WIRE, Merchant Quality

		(6 to 8 gage)	An'ld Galv.
AlabamaCity	R2.	5.70	5.95
Aliquippa	J5	5.70	6.15
Atlanta	A11	5.95	6.40
Bartonville(19)	K4	5.70	6.15
Buffalo	W12	4.85	...
Cleveland	A7	5.70	6.15
Crawfordsville	MS	5.95	6.40
Donora,Pa.	A7	5.70	6.15
Duluth,Minn.	A7.	5.70	6.15
Fairfield	T2	5.70	6.15
Houston,Tex.	S5 .	6.10	6.55
Johnstown	B2 ..	5.70	6.15
Joliet,Ill.	A7	5.70	6.15
KansasCy,Mo.	S5.	6.30	6.75
Kokomo	C16 ...	5.80	6.05
LosAngeles	B3 ..	6.65	...
Minnequa	C10 ...	5.95	4.45
Monessen	P7	5.95	6.40
Palmer	W12	5.15	...
Pitts.,Calif.	C11.	6.65	6.80
Prtsmth. (18)	P12 .	6.10	6.60
Rankin	A7	5.70	6.15
So.Chicago	R2 ..	5.70	5.95
So.S.Fran.	C10 ..	6.65	7.10
SparrowsPt.	B2 ..	5.80	6.25
Sterling,Ill. (1)	N15	5.70	6.15
Struthers,O.	Y1 .	5.70	6.15
Torrance,Cal.	C11	6.65	...
Worcester	A7 ...	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7.	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5.	8.85	9.10
SparrowsPt. B2..	8.65	8.90
Struthers,O. Y1..	8.55	8.80
Worcester J4, T6.	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2...4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill. (1)	K4 ..4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	M8 .5.10
Donora,Pa.	A7 .....4.85
Duluth,Minn.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O. (24)	S1 ....5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 ....5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ...5.10
Monessen,Pa.	P7 .....5.10
Newark, 6-8 ga.	I-1 ..5.50
No.Tonawanda	B11 ...4.85
Palmer,Mass.	W12 ....5.15
Pittsburg,Calif.	C11 ....5.80
Portsmouth,O.	P12 .....5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10....5.80
SparrowsPoint,Md.	B2..4.95
Sterling,Ill. (1)	N15 ....4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ....5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 .....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	M8..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ..6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 ....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ....6.50
Pawtucket,R.I. (12)	N8..6.85
Trenton,N.J.	R5 .....6.15
Worcester,Mass.	A7 ....6.15
Worcester,Mass.	T6 ....6.50
Worcester,Mass.	W12 ...6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 .....8.50
Monessen,Pa.	P16 .....8.50
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 ..8.60
Johnstown,Pa.	B2 .....8.50

WIRE, Tire Bead

Bartonville,Ill. (1)	K4..10.90
Monessen,Pa.	P16 ....11.40
Roebling,N.J.	R5 .....11.55

WIRE (16 gage)	An'ld Galv. Stone	Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 10.25	11.95
Cleveland	A7 ..10.25	12.15
Crawfrdsville	M8.10.30	12.00
Fostoria,O.	S1' ..10.40	13.00
Johnstown	B2 ..10.25	12.15
Kokomo	C16 ....10.25	11.95
Minnequa	C10 ...10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ...10.60	12.50
Prtsmth. (18)	P12.10.55	12.30
SparrowsPt.	B2..10.35	12.25
Waukegan	A7 ..10.25	12.15

WIRE, MB Spring High Carbon

Aliquippa,Pa.	J5 .....6.25
Aiton,Ill.	L1 .....6.45
Bartonville,Ill (1)	K4 ..6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth,Minn.	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass. (12)	N6 .8.05
Monessen,Pa.	P7, P16 .6.25
Palmer,Mass.	W12 ....6.55
Pittsburg,Calif.	C11 ...7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 .....6.25
So.Chicago,Ill	R2 .....6.25
So.SanFrancisco	C10 ...7.20
SparrowsPoint,Md.	B2 .6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 .....6.25
Worcester A7, T6, W12.	6.55
Worcester,Mass.	J4 ....6.75

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill. (1)	K4 ..8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	M8..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Palmer,Mass.	W12 .....9.20
Portsmouth,O.	P12 ...8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 .....8.90
Worcester,Mass.	A7 T6.9.20

WIRE, Barbed	Col.
AlabamaCity,Ala.	R2 ...137
Aliquippa,Pa.	J5 141
Atlanta	A11 144
Bartonville,Ill. (19)	K4 ...144
Crawfordsville,Ind.	M8 ..146
Donora,Pa.	A7 141
Duluth,Minn.	A7 141
Fairfield,Ala.	T2 141
Houston,Tex.	S5 149
Johnstown,Pa.	B2 141
Joliet,Ill.	A7 141
KansasCity,Mo.	S5 153
Kokomo,Ind.	C16 143
Minnequa,Colo.	C10 147
Monessen,Pa.	P7 146
Pittsburg,Calif.	C11 161
Portsmouth,O. (18)	P12 ..148
Rankin,Pa.	A7 141
So.Chicago,Ill.	R2 137
So.SanFran.,Calif.	C10 ..161
SparrowsPoint,Md.	B2 ..143
Sterling,Ill. (1)	N15 141

BALE TIES, Single Loop	Col.
AlabamaCity,Ala.	R2 ..123
Atlanta	A11 126
Bartonville,Ill. (19)	K4 .123
Crawfordsville,Ind.	M8 .132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So. Chicago,Ill	R2 123
So.SanFran.,Calif.	C10 .147
SparrowsPoint,Md.	B2 ..125
Sterling,Ill. (1)	N15 123

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16 .5.90
NewHaven,Conn.	A7 ..6.20
Palmer,Mass.	W12 ...6.20
Pittsburg,Calif.	C11 ...6.85
Portsmouth,O.	P12 ...5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10 ...6.85
SparrowsPoint,Md.	B2..6.00
Torrance,Calif.	C11 ...6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 ...6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala.	R2 ..127
Ala.City,Ala.,17-18ga.	R2 214
Aliquippa,Pa.	9-14½ga.J5 131
Atlanta	A11 134
Bartonville,Ill. (19)	K4 ..131
Crawfordsville,Ind.	M8 ..133
Donora,Pa.	A7 131
Duluth,Minn.	A7 131
Fairfield,Ala.	T2 131
Houston,Tex.	S5 139
Johnstown,Pa.	B2 131
Johnstown,17ga.,6"	B2 ..205
Johnstown,17ga.,4"	B2 ..208
Joliet,Ill.	A7 131
KansasCity,Mo.	S5 143
Kokomo,Ind.	C16 133
Minnequa,Colo.	C10 139
Monessen,Pa.	P7 136
Pittsburg,Calif.	C11 154
Portsmouth,O. (18)	P12 ..138
Rankin,Pa.	A7 131
So.Chicago,Ill.	R2 127
Sterling,Ill. (1)	N15 131

FENCE POSTS

ChicagoHts.,Ill.	C2 ...140
Duluth,Minn.	A7 125
Franklin,Pa.	F5 140
Huntington,W.Va.	W7 ..140
Johnstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago,Ill.	R2 140
Tonawanda,N.Y.	B12 ..140
Williamsport,Pa.	S19 ...150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 ....9.85
Lebanon,Pa. (31)	B2 ...9.85
Minnequa,Colo.	C10 ...9.85
Pittsburgh	O3, P14 ..9.85
Seattle	B3 .....10.35

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa.	U5			
Ensley,Ala.	T2	3.60	3.50	3.55	4.00
Fairfield,Ala.	T2	3.60	3.50	...	4.00
Gary,Ind.	U5	...	...	...	4.00
Huntington,W.Va.	W7 ..	3.60	3.50	3.55	...
Ind.Harbor,Ind.	I-2	...	...	...	5.00
Johnstown,Pa.	B2	3.60	3.50	3.55	...
Lackawanna,N.Y.	B2	...	...	...(16)	4.00
Minnequa,Colo.	C10	3.60	3.50	...	4.00
Steelton,Pa.	B2	3.60	3.50	...	4.50
Williamsport,Pa.	S19 ...	3.60	3.50	...	...
		...	...	...	4.75

NAILS & STAPLES, Stock
To dealers & mfgrs. (7) Col.

AlabamaCity,Ala.	R2 ..118
Aliquippa,Pa. (13)	J5 ..118
Atlanta	A11 121
Bartonville,Ill. (19)	K4 ..118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	M8 .122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 126
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 120
Minnequa,Colo.	C10 122
Monessen,Pa.	P7 124
Pittsburg,Calif.	C11 137
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2 ..120
Sterling,Ill. (1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 ...124

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa.	A3 .$7.35
Wheeling.W.Va.	W10 ..7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ...4.50
Lackawanna,N.Y.	B2 ...4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ....4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bessemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	U5 .....4.70
Lackawanna,N.Y.	B2 ...4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1.6.15
KansasCity,Mo.	S5 ....6.40
Lebanon,Pa.	B2 .....6.15
Minnequa,Colo.	C10 ....6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 ....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S13 ....5.60
Johnstown,Pa.	B2 ....5.60

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Anaylsis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 25 Ga. 30" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,Eaton Mfg.

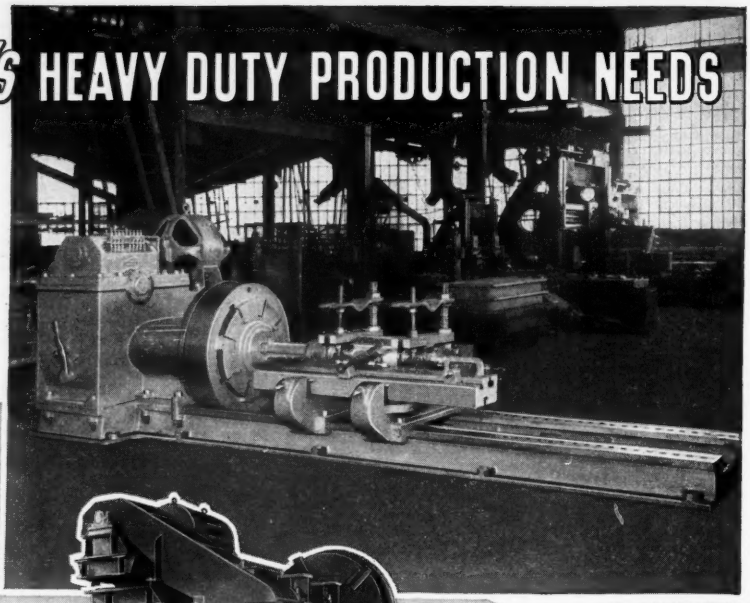
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

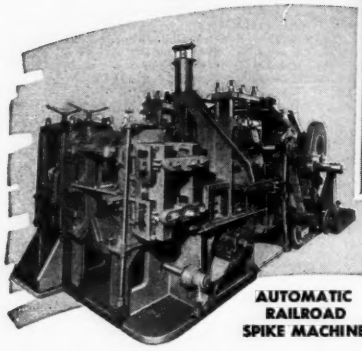
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

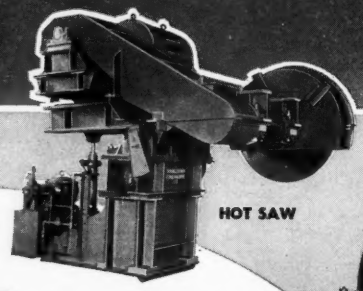
SERVING *TODAY'S* HEAVY DUTY PRODUCTION NEEDS

F & Y



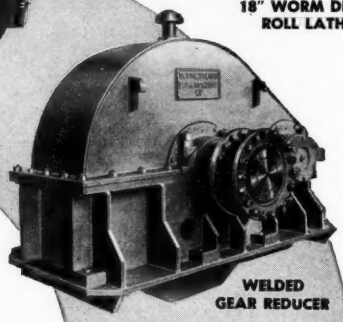


AUTOMATIC RAILROAD SPIKE MACHINE

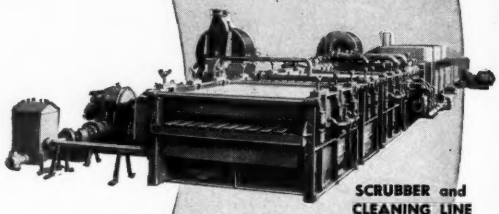


HOT SAW

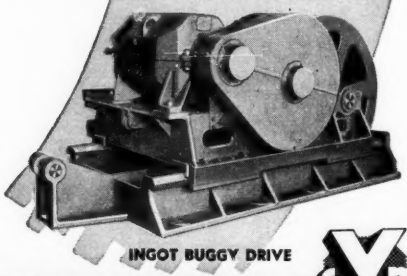
18" WORM DRIVE ROLL LATHE



WELDED GEAR REDUCER



SCRUBBER and CLEANING LINE



INGOT BUGGY DRIVE

Check this List for the Products You Need

PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
HYDRAULIC SLAB AND BILLET PILERS
STRIP AND SHEET OILING EQUIPMENT
SHEET SCRUBBER AND CLEANING LINES
HOT SAWS—ROCKING AND SLIDE TYPES
HOT BEDS—COOLING BEDS—TRANSFERS
BILLET EJECTORS—PINCH ROLL STANDS
SLITTERS—SPECIAL SHEARS AND GAUGES
TILTING TABLES—Traveling and Lifting Tables
Continuous PICKLING Lines—ROLLER LEVELERS
FURNACE Charging Equipment—Furnace Pushers
Strip Steel COILERS and REELS—SCRAP BALLERS
RAILROAD Spike Forming Machines—ROLL LATHES
Sheet GALVANIZING Lines—Wire Patenting Frames
Stretcher Levelers—Angle and Shape Straighteners
Rolling Mill Tables—Gear and Individual Motor Types
DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

F & Y

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

3

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+19.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	44.0	41.0	20.5	22.5	19.5
1½	27.5	2.78	42.5	41.5	41.5	21.5	20.0	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½ % on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ½", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜"; Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ¼", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ½", 2 points lower on 1", 1¼", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger; Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1⅝	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ⅞-in.	12	6.5
1-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	16.5	6.5
1-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	23	17.5
1-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅞-in.	29.5	22
1-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
⅞-in. & smaller		35
1-in. to ⅞-in.		28.5
1-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

½-in. & smaller	42
⅝-in. through 1 in.	34

Longer than 6 in.:

½-in. & smaller	26
⅝-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
CARBON		
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg...26.00-33.00

Industrial xylol .25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia.$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots..	17.00
Swedish, c.i.f. New York, in bags.	.8.85-9.95
Electrolytic Iron:	
Annealed, 99.5% Fe.	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns	..83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Antimony	75.85
Brass, 10-ton lots.	30.00-33.25
Bronze, 10-ton lots	.51.25-60.00
Phosphor-Copper, 10 ton lots	50.00
Copper:	
Electrolytic	...37.25-46.25
Reduced	.....33.75-37.00
Lead	25.50
Magnesium	.....75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver, 10-ton lots	45.00
Silicon	38.50
Solder (plus cost of.. metal)	8.50
Stainless Steel, 302	.. 83.00
Zinc, 10-ton lots.	.23.00-30.50
Tungsten	Dollars
Melting grade, 99%, 60 to 200 mesh, freight allowed:	
1000 lb and over	.. 6.00
Less than 1000 lb	.. 6.15
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	... 4.15
Less than 1000 lb	.. 4.25
Molybdenum: 99.9%, minus 200 mesh	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil,fur.	.$14.50-15.00
Connelsvil,fdry.	.17.00-18.00
New River foundry	...21.30
Wise county, foundry	..15.95
Wise county, furnace	..15.20

OVEN FOUNDRY COKE

Kearny, N. J. ovens.	.$22.75
Everett, Mass., ovens	
New England, del.	..*24.80
Chicago ovens.	.....23.00
Chicago, del.	.....24.50
Terre Haute, ovens	....22.50
Milwaukee, ovens	....23.75
Indianapolis, ovens	....22.75
Chicago, del.	.....26.42
Cincinnati, del.	.....25.85
Detroit, del.	.....26.85
Ironton, O., ovens	....22.50
Cincinnati, del.	.....25.12
Painesville, O., ovens.	.24.00
Cleveland, del.	.....25.82
Erie, Pa., ovens	.....23.50
Birmingham, ovens	....20.30
Birmingham, del.	....21.60
Philadelphia, ovens	....22.70
Nevillelsland,Pa.,ovens	23.00
Swedeland, Pa., ovens.	22.60
St. Louis, ovens	
St. Louis, del.	.....25.40
Portsmouth, O., ovens.	.22.50
Cincinnati, del.	.....25.12
Detroit, ovens	.....24.00
Detroit, del.	.....25.00
Buffalo, del.	.....26.89
Flint, del.	.....26.59
Pontiac, del.	.....25.47
Saginaw, del.	.....26.92

* Or within $4.15 freight zone from works.

DRAVO HEATERS

Saved $530,000*

in mammoth new auto plant

*Compared with conventional steam system cost.

Half a million is important money in anybody's language —and it gets more important when it's SAVED instead of spent.

That's just what happened when a leading automobile manufacturer recently built a mammoth new body stamping plant, with over 600,000 sq. ft. of floor space, and with ceiling heights ranging up to 52-feet. Heat requirements, including fresh air tempering provisions, totalled 54,250,000 Btu. Lowest quoted price for a conventional steam boiler plant was $860,000. ACTUAL cost of a complete Dravo *Counterflo* Heater installation of 53 units was $330,000. These direct-fired warm-air heaters take care of all open-space heating requirements of the manufacturing area of the plant.

Bear in mind that these savings involved no compromise with heating effectiveness. The top-flight engineers responsible for selection knew how vital *comfort* is in keeping employes contented and promoting top output. They looked *first* for the finest in heating results . . . and *second* for economies. They found both profitably combined in Dravo Heaters.

Neither did this saving come from "cutting corners" in building the heater, but rather through the basic simplicity of method and equipment. Each of the oil-fired space heaters manufactures heat "on demand" to blanket its own assigned area with warmth. It also introduces fresh, tempered air into the building as needed. Modulating burner controls permit continuous operation and continuous air circulation. This minimizes temperature fluctuation, assures maximum comfort in all weathers, and conserves fuel—for when any section needs LESS heat, its unit burns LESS fuel. Units all have the Underwriters' Laboratories label. They can be converted from oil to gas, should the fuel situation make this desirable.

This spectacular saving has been duplicated on a lesser scale in thousands of smaller plants. If you are concerned with heating any new or old building, you owe it to yourself to find out how Dravo *Counterflo* Heaters are serving and saving for others . . . and how they can save both system costs and operating costs for YOU. Look in the yellow section of your phone book—or write us direct at Dravo Building, Pittsburgh 22, Pa., for Bulletin FH-523.

DRAVO

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON

Sales Representatives in Principal Cities. Mfd. and Sold in Canada by Marine Industries, Ltd., Sorel, Quebec.

Export Associates: Lynch, Wilde & Co., Washington 9, D. C.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras. Prices listed were in effect prior to Dec. 16 on which date CPR 98 became effective. Revised schedules will appear in following issues.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try).	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)..	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va..	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse).	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse)..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.82
Cleve. (w'hse).	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city).	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwau. (city).	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse).	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[2]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse).	6.35	7.90	8.85[2]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
Seattle-Tacoma.	6.65	7.80[4]	8.90[2]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
San Francisco..	7.05	8.60[2]	9.20[2]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.6c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max, 7% Si. Special Grade: (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. **(Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.).** Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

NOTE: Curent prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 139, Nov. 26 issue; calcium, zirconium and briquetted alloys, page 163, Dec. 10. Refractories prices also were published on page 163, Dec. 10 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Oct. 23, 1951

STEELMAKING SCRAP COMPOSITE

Dec. 13	$43.00
Dec. 6	43.00
Nov. 1951	43.00
Dec. 1950	45.50
Dec. 1946	27.69

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	Grade 1 No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Boring & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turning	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
30. Hard Steel cut 2 ft & under	+ 5.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.
(6) Prices for Grade 30 may be charged only when sold to a gray iron foundry; otherwise price for Grade 20 will prevail.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes.	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under.	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses, otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1.)

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes.	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be celing price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 2a, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:
(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6. For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:
(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (Including Chester, Pa), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sporrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, 70c.
Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Boring, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd.	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point.

For power economy in press operation: A double-pressure pump, automatically lubricated, with totally-enclosed mechanism.

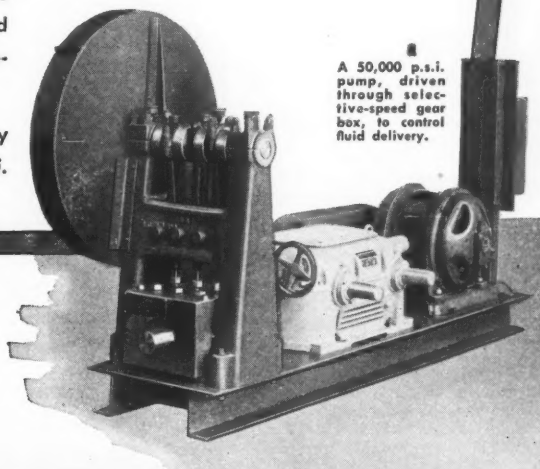
LOGEMANN HYDRAULIC PRESSURE PUMPS

Absolute Reliability... Maximum Delivery... Low Maintenance Cost... and Smooth Operation

Logemann Brothers offer a complete line of specially-designed High Pressure Pumps in a wide range of sizes featuring both single and double pressure types. Both vertical and horizontal styles are proving highly successful in press and accumulator operations and for hydrostatic test purposes.

Pressures range from approximately 2,000 p.s.i. to in excess of 50,000 p.s.i.

When making inquiries will you please include your pressure and gallonage requirements and indicate the type of application.



A 50,000 p.s.i. pump, driven through selective-speed gear box, to control fluid delivery.

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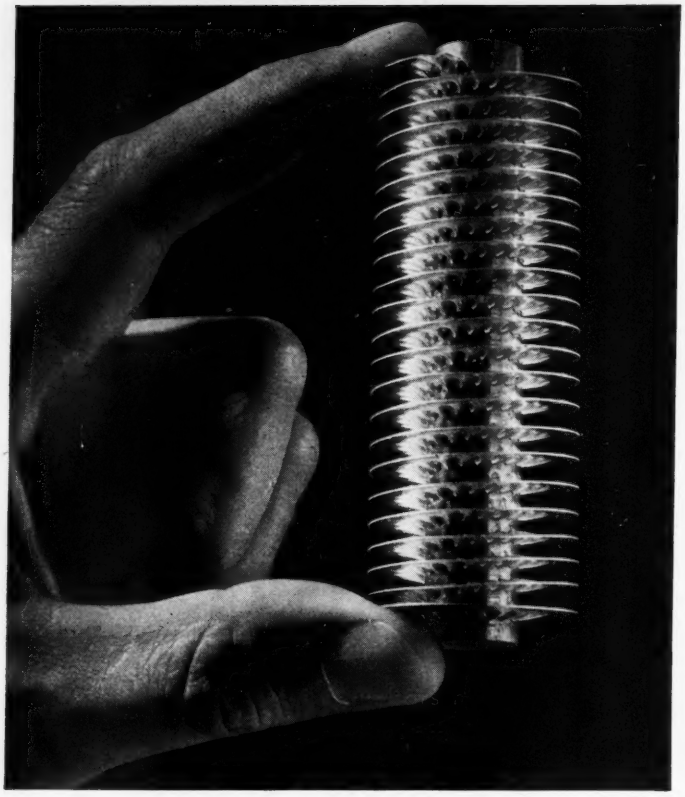

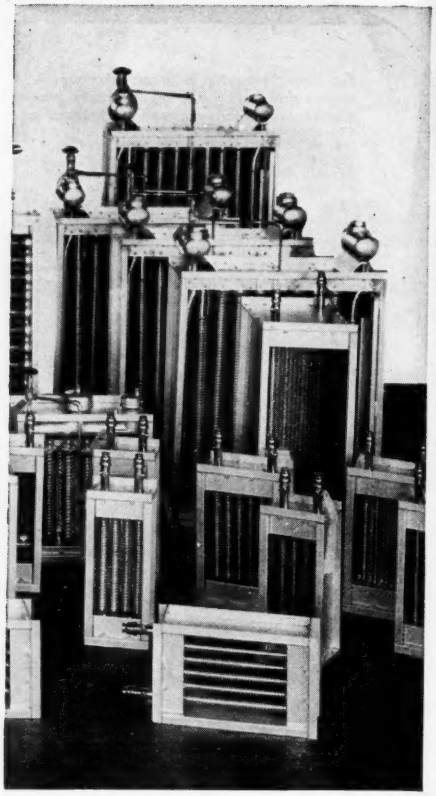

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EFFICIENCY OF ALUMINUM CUTS COSTS!

THE unique combination of advantages offered only by aluminum are utilized by Aerofin Corporation of Syracuse, N. Y., to make its heat exchangers *not only highly efficient but also less costly to produce.*

The helical aluminum fin is so *light* in relation to its *high heat conductivity* that it is much *more economical in metal costs* for a given unit of heat transferred.

In addition, aluminum is so *formable* that complex forming, crimping and pressure-winding operations are possible at low cost.

Durability of these stretched and compressed aluminum coils is demonstrated by the fact that they maintain a tight bond to the tube after more than eight years' service. Also contributing to this long life is aluminum's *high resistance to corrosion.*

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The Metal Market

NPA plans to allocate aluminum scrap to assure suppliers of castings sufficient metal to meet rapidly expanding demands of the military. Secondary ingot shipments gain

SUBSTANTIAL increases are expected in military orders for aluminum castings in the first quarter of 1952, particularly in view of the aircraft production program. Since some castings companies failed to receive sufficient secondary metal from their suppliers in October and November to enable them to fill all of their orders, a way must be found to stimulate activity in the smelting industry.

Officials of National Production Authority say that larger tonnages of remelt ingot are moving into consuming channels. Shipments of secondary ingot by smelters in October totaled 22 million pounds compared with 17,716,000 pounds in September. During the past few weeks the upswing in shipments has continued. The maldistribution of scrap has been the chief factor in hampering expansion of aluminum castings production.

Aluminum scrap will be placed under allocation soon so that NPA will be able to direct its distribution to the best advantage of the mobilization program. The vital necessity of maintaining a supply of aluminum scrap to secondary smelters and others who provide the castings industry with metal is recognized by the government.

Scrap is Diverted—Smelters of secondary aluminum, dependent almost entirely upon scrap for their metal, have suffered in recent months because of their inability to obtain enough scrap to meet demands. The flow of aluminum scrap to smelters declined seriously following establishment of ceiling prices on the metal.

There are indications, however, that the trend is now upward and more scrap is being made available for the production of secondary aluminum. This trend followed an NPA action to limit the acquisition of scrap during the fourth quarter of 1951 by producers of primary aluminum. This limitation will be continued in the first quarter of 1952.

Such action, together with the directed distribution of scrap, is expected to provide more metal to smelters, reclaimers and fibricators in coming months.

Representatives of the aluminum smelters industry recommend that primary producers be limited by NPA to acquiring 21 million pounds or less of old aluminum scrap during the first quarter. They also suggest that not more than 40 per cent of the quarterly tonnage permitted primary producers be authorized for purchase and shipment during any one month.

Steps are being taken to change the method of disposing of aluminum scrap generated by the military. At present this scrap is sold to the highest bidder and it is difficult to follow it to its end use. By directing this scrap into the hands of smelters, reclaimers, producers and fabricators, substantial quantities will reach defense channels in the first quarter of 1952.

Copper Supply Gains Slowly

Copper supply situation looks a trifle better, says H. R. Michel, Westinghouse Electric Corp., Washington. He pointed out in his report published in the National Association of Purchasing Agents' *Bulletin* that total authorizations against the national stockpile since mid-August amount to 55,000 tons, representing an appreciable and much needed supply boost. However, both crude production and refined production show real gains from the lows of late summer.

"With reference to the imported portion of our supply," Mr. Michel said, "we are 30 per cent below 1950 for the first nine months of this year. The problem has received much attention, but the world price is out of hand and it appears impossible to outbid those who need copper worse than we . . . . Scrap is moving a little better to brass mills, but total supply will continue basically short.

"The difficulties of increasing supply are well demonstrated by the recent arrangements between DMPA and several large copper producers. By an investment of many millions of dollars in mines, plants and equipment, total production may be increased by 10 per cent in about 2 to 3 years, minus any loss from current production over the same period, due to depletion of ores . . . .

"The unavoidable impact on industry in the form of fewer CMP tickets for first-quarter 1952 for regular products, particularly consumer durables, is being felt more and more as the New Year approaches . . . . The business man who finds it possible to conserve and substitute or who plans on so doing, on the basis that copper will continue in short supply for an indefinite period, is doing his country a service . . . ."

Lead Stocks Remain Tight

Until such times as there is a better balance between domestic ceiling prices and prices in world markets, no real improvement can be expected in supplies of pig lead available to consumers in the United States. This opinion was expressed by J. J. Sharkey, Western Cartridge Co. Division, Olin Industries Inc., East Alton, Ill. There is some opinion, he added, that demands in European markets may not continue to support the higher world prices, which could result in a restoration of the former rate of imports of lead into the United States.

The domestic supply situation is being adversely affected by continuation of the strike at St. Joseph Lead Co.'s Herculaneum smelter. This strike has resulted in the loss of nearly 10,000 tons of corroding grade lead.

U. S. Smelting Buys Firms

United States Smelting, Refining & Mining Co., Boston, acquired the properties of Bingham-Conger Copper Co. and United Bingham Copper Co. for a consideration aggregating $800,000. The purchasing company previously had held substantial interests in both of the Bingham companies.

Bingham-Conger holds 130 acres of patented mining claims in the Bingham, Utah, district while United Bingham Copper Co. holds claims totaling 265 acres in that district. Upon completion of the transaction, the purchased firms will be dissolved.

Wark Work Takes More Zinc

The supply situation in zinc is not as severe as in either copper or lead, but consumers are continuing to request more metal than is currently available for allocation. It is possible that restrictions on uses of zinc may result in some further increase in producers' stocks.

As the transition from civilian to defense production increases in tempo, larger tonnages of zinc are being diverted to the more essential defense needs. Larger tonnages are being diverted to the brass mills for defense requirements.

Aluminum Output Increases

With the Pacific Northwest power situation back to normal, the United States aluminum production again has hit its stride. October production follows closely the output in July and August, says Donald M. White, secretary, Aluminum Association, New York.

Primary aluminum production in October totaled 145,293,592 pounds, an increase of 6,436,062 pounds over September.

Shipments of sheet and plate reported by the association's Sheet Division also showed an increase over September, amounting to 83,221,117 pounds in October as against 77,670,405 pounds in the preceding month.

Aluminum foil shipments by the association's Foil Division held to about the same level, amounting to 7,521,864 pounds in October compared with 7,210,055 pounds in September.

October shipments of permanent and semipermanent mold rough castings (except pistons) reported by members of the association's Foundry Division were 2,645,725 pounds with a value of $1,515,912. This is an increase of about 4 per cent over September shipments of 2,544,405 pounds with a stated value of $1,393,025.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $215-$218 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.42; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 29.60-30.60, l.c.l. 30.10-31.10, 100,000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.0 0-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R-317-T4	——Hexagonal—— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) **Sheets:** Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. **Pipe:** Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets, 26.50c. f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

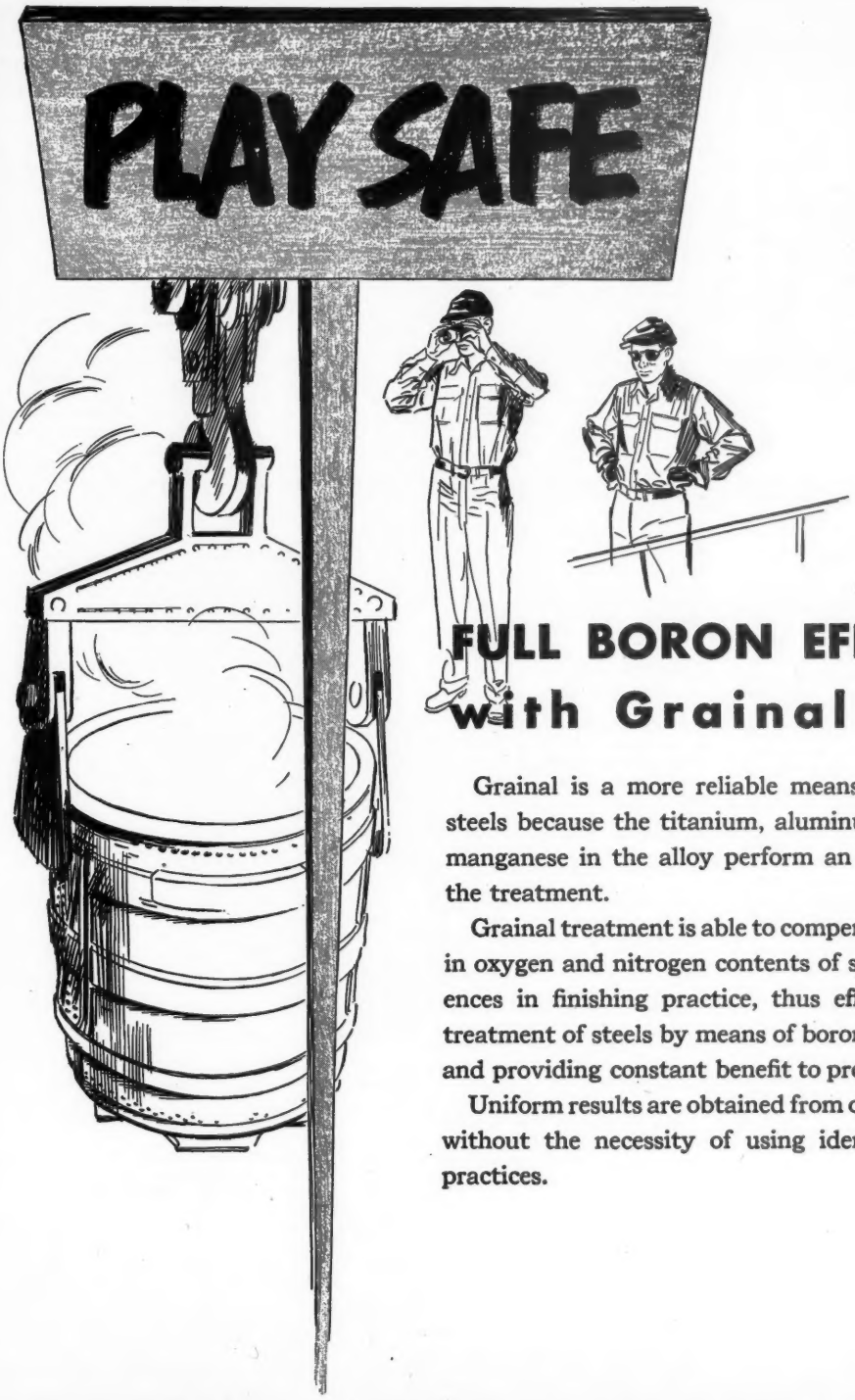
(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Dec. 1-13	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. 21-30	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. 1-20	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.



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MAKERS OF ALLOYS

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CHEMICALS AND METALS

Sheets, Strip . . .

Sheet and Strip Prices, Page 149 & 150

Chicago — Yearend carryover of sheets and strip in this district will range between one and three weeks, a volume which is not too far out of line when related to the 15 days now allowed by NPA at start of a new quarter for consumers to receive shipments and charge same to previous quarter allotments. Evidence is accumulating that supply of cold-rolled material may catch up with requirements before long. Hot-rolled remains exceedingly tight and it will not be surprising to see cold-rolled used as a substitute where possible.

Los Angeles — Kaiser Steel Co., Fontana, reduced sheet arrearages to 6,000-7,000 tons from 10,000-15,000 tons of last month, and hopes to be back on schedule for first quarter. Fabricators report sheet in better supply than for months past.

Boston — Producers are opening books for second quarter on some light, flat-rolled products, but there are still openings in first quarter schedules on straight chromium stainless and silicon grades. Overall pressure for sheets and strip is easier with scattered order cancellations. These latter include preliminary orders placed for first quarter for which CMP tickets were not forthcoming. In other cases, consumers find they do not need steel in the quantity originally estimated.

New York—Pressure to place sheet orders has eased and there are some cancellations where consumers placed earlier orders in excess of authorized allotments for first quartre. In scattered cases users also find they do not need authorized tonnage as soon as anticipated. Straight chromium grades of stainless are in good supply and heavier orders could be taken for that grade. Among tightest flat-rolled products are galvanized.

Philadelphia — Slackening in demand for carbon sheets, hot and cold-rolled, has been slight, although in the latter less tonnage assigned to the automobile industry is opening up some space. Comparatively easy in tonnage offers are straight chromium grades and silicon strip and sheets. Directive has been placed on one producer to convert a continuous strip mill to plates. Aggregate capacity of sheet and strip production diverted to plates is heavier.

Pittsburgh—Sheetmakers note the easing during the last few weeks in carbon sheets—from cutbacks in consumer durables—is now being taken up by an increase in military and defense business. Mills expect some carryover tonnage at year's end but it will not be as great as was expected some weeks back. However, first quarter books for carbon steel are completely filled in this area. Only second quarter business being entered by the majority of producers is for military and defense purposes. Silicon sheets and long ternes are still in good supply with many fabricators turning to ternes where they can be substituted for galvanized material.

Cleveland—Sheetmakers are booked virtually full for first quarter despite cutbacks in consumer durable goods requirements. Expectations are additional rolling time for light plate production will be scheduled on continuous mills after the first of the year. This is expected to take up any slack in the light flat-rolled products stemming from the curbing of civilian goods manufacture. Currently, sheetmakers are not booking tonnage for second quarter except for high-rated defense projects. Because of the uncertain market outlook over coming weeks, producers are inclined to delay opening books for the period as long as possible. However, under government regulations, as interpreted by some large producers, books must be opened 90 days prior to the beginning of a quarter. This means bookings for second quarter will begin on a large scale at the turn of the year.

Youngstown—Aetna-Standard Engineering Co., has booked a contract from Pittsburgh Steel Co. for two strip shearing lines for Pittsburgh Steel's new strip and sheet mill expansion program. Most of the work will be done at the Aetna-Standard plant in Ellwood City, Pa.

Cincinnati—District sheet mills are under less demand pressure. Sources and nature of requirements are constantly shifting in the diversion of steel from consumer usage. Capacity operations on light plates are reported.

Plates . . .

Plate Prices, Page 149

Philadelphia—Controls and alloy restrictions are holding down volume of clad plates, notably nickel clad which becomes a classified alloy product in second quarter. Mills with books open for second quarter are booking much along first quarter pattern with leeway left for second quarter allotments when issued. Slight easing is noted in light plates due to strip mill conversion, but heavy gage plates are hampered by lack of slabs for conversion in sizes and quantity required. Tank demand is holding. Part of heavier demand for tanks is due to expansions in air field storage facilities. Bids are in on approximately 100 knock-down tanks for the Corps of Engineers, Philadelphia.

Boston—While there will be carryover tonnage in heads and flanged work, platemakers are making every effort to reduce this volume by Jan. 1 when heads will be included in plate allotments. Starting second quarter stainless clad plates will be classed as an alloy product and small users will be able to order a minimum of eight tons per quarter without authorizations. Minimum of 30 tons of carbon plates without allotment to small users will increase non-allocated volume in second quarter. In view of expected increase in steel prices, few consumers are showing much concern. Some are reducing inventories. Less work is being estimated and many shops are operating largely on backlogs.

Pittsburgh—Demand is unabated for material in this producing area. Mills see no improvement in the supply-demand picture for months to come. It is questioned here if the rolling of lighter plates on the district's continuous hot strip mills will be the answer to the short supply situation. Fabricators say they could use 35 per cent more material than they are being allotted today; some say they are turning down job inquiries due to their pessimism over securing required material. Fourth quarter CMP tickets are still unplaced in this area. Year-end carryover tonnage is expected to be large.

Seattle—Plate fabricators report a fair run of small jobs but scarcity of steel is making them cautious on large commitments.

Steel Bars . . .

Bar Prices, Page 149

Boston — Additional mills have opened books for second quarter, notably on alloy bars. Large size hot-topped tonnage for forge shops and other consumers is limited and the trend in shipments to warehouses is toward smaller sizes with curtailment in large bars. Some pressure is being brought on consumers to use bessemer grades where possible. While some orders covered by CMP tickets are still unplaced for first quarter, not too much steel would be required to meet these requirements in this area. Users are not snapping up everything offered and are more cautious in adding to inventory. Defense contracts requiring bars are mounting and bids are in on 5000 tons of carbon bars for remelting, Watertown arsenal. This government shop also is buying forgings in larger quantity, some machined and heat-treated.

Philadelphia—Carbon and alloy bar demand is bolstered by an increasing volume of defense contracts. Where books are open on alloy bars for second quarter, space is being taken up with heat-treated alloys more extended. With some producers hot topping capacity for larger sized bars is a bottleneck with substantial carryover into next quarter likely.

Pittsburgh—Bars continue in terrific demand with increasing pressure being felt for military and defense end-uses. Inquiry for forging bars seems to increase each week. Producers anticipate a large carryover into 1952 with many fourth quarter CMP tickets still unsatisfied. Some mills have opened books for second quarter; others have not. While not seen as a trend, mills report that the larger sizes seem to be easing somewhat.

Cleveland—Indications are there will be substantial bar carryover into first quarter. Extent to which this will disturb schedules in that period is uncertain. The further cutbacks in civilian goods are expected to lessen the demand burden on the mills sufficiently to permit absorption of most of the overflow without too much trouble. With military requirements steadily increasing, there is little chance of any easing in bar supply conditions through the first half of 1952.

Chicago — There is no indication that supply of bars will match demand any time soon. Despite production limitations on civilian goods, requirements for hot-rolled bars and forging billets are very heavy. It would not be surprising to see more conversion steel rolled into bar products versus flat-rolled as has been the case previously.

Los Angeles—Cold-drawn bar pro-

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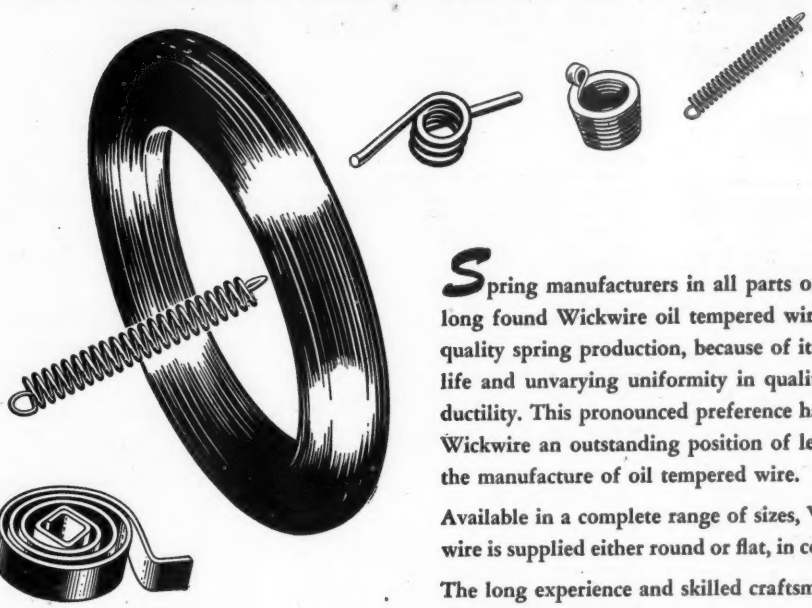

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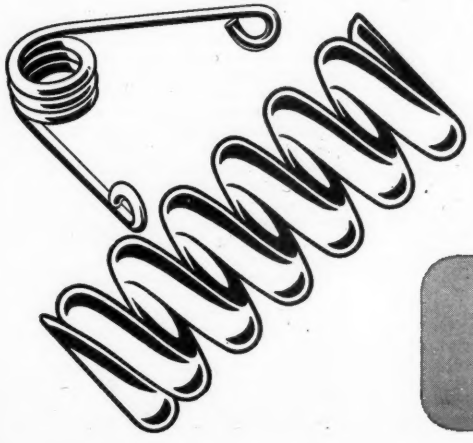

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ducers report their customers are having no trouble getting conversion hot-bars. Conversion work of cold-drawers is 20 per cent of production.

Wire . . .

Wire Prices, Page 151

New York—Demand for high carbon specialty wire has slackened with limited openings reported in first quarter schedules. Decline in volume covers most consumer products, including automobiles. Defense orders, while slightly heavier, are not offsetting losses. Consequently backlogs are less extended. Swedish steel is coming in limited volume, but high cost retards use. Critical supply of copper, zinc and other nonferrous metals is affecting demand for steel wire processed with these materials.

Boston—Demand for wire products is spotty with the decline in civilian requirements not balanced by new defense contracts. Screw manufacturers are reducing backlogs. Alloy demand is effected by lagging procurement for aircraft and frequent specification changes. Galvanized wire is in limited supply. Copper washed or coated wire is among the market's soft spots.

Semifinished Steel . . .

Semifinished Prices, Page 149

Pittsburgh — District steelmaking operations are in high gear, despite acute scrap shortage. U. S. Steel spokesmen recently said that after the present emergency is over many marginal steelmaking units will be dismantled. Slated to go is No. 3 open-hearth shop and related mills at Homestead, Pa. works. This shop contains twenty 75-ton furnaces with annual capacity of 1,006,000 tons. Also slated to go in the future are twelve 104-ton capacity furnaces at Clairton, Pa. plant. Only the marginal units are slated for extinction.

Los Angeles—Francis S. Howard, division vice president, Columbia Steel Co., subsidiary, U. S. Steel, speaking to the California State Chamber of Commerce, said the gap between the West's demand for steel and ability of western steelmakers to supply that demand is narrowing. In 1940 western steel plants produced only 28 per cent of the steel consumed in the West compared with more than 60 per cent now. Production of western-made steel has tripled within the last decade while steel consumption in the area has doubled. Mr. Howard said that approximately 70 per cent of steel sold by U. S. Steel in the Far West last year was produced by western steel plants of Geneva Steel Co. and Columbia Steel Co., U. S. Steel subsidiaries.

San Francisco—Record steel production and steel fabrication is assured Bethlehem Pacific Coast Steel Corp. this year.

The company lists the following plant improvements: SOUTH SAN FRANCISCO—Enlargement of open hearth steelmaking furnaces and expansion of the plant's transmision tower fabricating shop; additional shipping yard, equipped with overhead cranes, and a new galvanizing unit for the tower shop;

LOS ANGELES — Steelmaking changed from open hearth to electric furnace operation. The plant with two 75-ton and one 50-ton electric furnaces has a capacity for 370,000 net tons of ingots annually, increase of 300 per cent in five years. The plant's 12 inch rolling mill has been rebuilt and a new continuous billet heating furnace installed. Annealing capacity quadrupled and wire drawing output increased 20 per cent. Bolt and nut department modernization completed.

SEATTLE—All facilities completed in the new fabricating works, now largest in Pacific Northwest. Has structural fabricating and tower fabricating departments. Bolt and nut manufacturing facilities improved.

Tubular Goods . . .

Tubular Goods Prices, Page 153

Boston—Second quarter merchant pipe shipments will be affected by carryovers. First quarter allotments were sold out before the increase in jobber allocations by 17.5 per cent starting Jan. 1 was implemented. As a result, producers are oversold for the first three months. This will cut into direct carlot shipments materially. Allotments of galvanized pipe have either been eliminated for January or cut back sharply to 20 per cent. Where possible substitution of black pipe for galvanized is urged.

Use of electric weld pipe in place of seamless is also recommended.

Los Angeles—With 50 per cent of backlog rated orders, pipe fabricators expect large government pipeline project coming up for bid next year to increase that percentage.

Seattle—There is some inquiry current for cast iron pipe but the market is inactive. Seattle opened bids for 400 tons and accessories. Award of 500 tons of 24 and 16-in. for a system improvement at Bend, Oreg., is reported placed with the Pacific States Cast Iron Pipe Co., Provo, Utah.

Structural Shapes . . .

Structural Shape Prices, Page 149

Pittsburgh—Supply remains tight with producers still voicing the thought demand is inflated due to over-specifying of requirements by fabricators. The fabricators say they can't get enough of the required shapes to properly care for business now on books. Most mills believe the picture will materially improve after mid-1952 when a great deal of today's construction will be completed. Fourth quarter CMP tickets are still circulating but meeting no success in finding available rolling time. Pittsburgh Des Moines Steel Co. resumed operations after a nine-weeks strike at its Neville Island plant.

Boston—Shape allotments to structural fabricating shops are limited largely to specific jobs on hand. Beyond that little steel is available due to lack of CMP tickets. More building is of reinforced concrete due to delays in obtaining structural steel. More small bridges also are being designed for pre-stressed concrete, one state contract having been placed. Another handicapping factor is lack of balance in allocating structurals and plates for projects taking both products for fabrication.

New York—Due to restrictions on construction less fabricated structural steel is being estimated. Contracts placed are lower. Pending volume is bolstered by several large individual projects, three accounting for 42,500 tons, including subway extension, Brooklyn, 23,000 tons.

Philadelphia—Deliveries on fabricated structural material are slightly improved with some shops. Restrictions on construction, inroads on backlogs and better timing of plain material for specified projects accounts for this. Fabricating shops are getting little tonnage beyond what is required for specified work. Most steel in this category is highly rated. New contracts include 2300 tons, state bridges, Lancaster county, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

Seattle—Preholiday lull is affecting the structural market. Plant backlogs extend to March and fabricators are seeking second quarter business. Army decision is awaited on type of construction to be adopted for warehouses at Auburn and Mt. Rainier, Wash., involving 6000 tons of shapes if steel is preferred.

Rails, Cars . . .

Track Material Prices, Page 151

New York—Freight carbuilders delivered 9824 new units in November, a decline compared with 10,082 in October, but more than 4000 above output in November, 1950. During the month 6752 new freight cars were ordered and order backlog as of Dec. 1 stood at 129,158 units. Of this total 83,466 were held by independent carbuilders, and 45,692 by the railroads' own shops.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 149

Cleveland—Seasonal slackening in building activities is taking some of the pressure off concrete reinforcing bar suppliers. However, supply-demand balance is not in sight despite the fact considerable work has been cut back by government restrictions. Latest word from government steel control authorities is that supplies for schools, hospitals and other public buildings will continue scarce through most of 1952. Among larger jobs pending in the district involving reinforcing bars, are several bridges for the proposed Cleveland Rapid Transit. These bridges will require about 500 tons.

New York—Concrete steel bar demand has softened slightly, but more structures normally of steel frame design are going to reinforced concrete, including a score of New York city schools taking close to 6000 tons. Approximately half this tonnage has been placed. In part this change in school design follows trends in housing projects. Lack of allotments is holding up some construction, but foreign bars are offered freely. One utility bought a large tonnage of Belgian bars at 9.00c, port.

Pittsburgh — United States Steel Supply Co.—subsidiary, United States Steel Corp., is considering installation of a supplemental facility in this district for sizing reinforcing bars.

Seattle—Bar mills are anxious to reduce order backlogs as much as possible by yearend. Bulk of current production is reinforcing bars.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 153

Chicago—Sellers of foundry coke are pushing for sales in order to keep production moving. Consumption is down sharply because of reduced order volume for gray iron castings and in view of coke plenty foundries show no disposition to carry more than normal working inventories of fuel.

Pig Iron . . .

Pig Iron Prices, Page 148

Pittsburgh—Demand is strong in the area. While consumer castings have tapered-off in recent weeks, defense castings have taken up much of the slack. All stacks with exception of one are going full blast here. Long-term iron contracts have been made by Pittsburgh Coke & Chemical Co. with International Harvester Co. and Westinghouse Air Brake Co. covering a five-year delivery period. It was reported last summer that a third pig iron consumer—James B. Clow & Sons, Chicago—entered into a similar deal. These three consumers have agreed to loan Pittsburgh Coke from time to time on or prior to Dec. 31, $2,550,000. Loans are to bear interest at the rate of 3 per cent and mature June 30, 1958. Notes will be paid at the rate of $10.00 per ton of iron delivered. These three agreements require delivery of 51,000 tons annually beginning after completion of Pittsburgh Coke's new blast furnace on Neville Island next summer. It will have an annual capacity of 300,000 tons.

New York—Foundries are not participating in defense work to the extent anticipated and volume of new business is declining with most. This has eased pressure on foundry grades of pig iron with inventories better balanced. Reverse is true of basic iron, although production of that grade by non-integrated furnaces is larger. High rate of steel operations, also of steel foundries, with small scrap reserves, creates demand for every ton of basic iron available.

Melt at Watertown arsenal is higher with inquiry out for 250 tons of pig iron and 90 tons ferromanganese, the latter closing Dec. 20.

Buffalo—Despite a leveling off in demand from jobbing foundries, the leading producer of merchant pig iron here reports no indications that stock piling is near. Light jobbing plants have been forced to scout around for business, but strong demand from heavy industry casters continues. Substantial movement of iron to Michigan motor casters is reported, but all such melters are not still on automotive work entirely.

Cleveland—Yearend influences are a retarding factor in the pig iron market with curtailed schedules of the light castings shops likely to continue into the new year. Foundries on heavy castings are busy in some cases being unable to enlarge operations because of the scarcity of skilled labor. Raw material supplies are adequate. Merchant iron sellers report demand pressure is off somewhat though they still are entertaining more business than they can promptly satisfy. Step-up in demand for pig iron is expected early in 1952 as more castings shops get into defense production.

Cincinnati—Foundries are exerting less pressure for pig iron. The melt this month will be lighter, due to holiday interruptions and tapering castings demand from producers of consumer goods.

Chicago—Gray iron jobbing foundry operations average around 75 per cent of capacity due to lagging order volume. Demand for light castings is down more than for heavier. Practically all orders are of rated category. Some of the drop results from excess inventories in hands of consumers, resulting in holdbacks on production. These conditions are easing requirements for pig iron but sellers still find takers for all available tonnage. Blast furnace operations hold steady at 40 out of 42 stacks.

Seattle—Larger foundries are active, reflecting defense demands for castings. Some of the smaller shops, however, are slowing down over the holidays.

Scrap . . .

Scrap Prices, Page 156

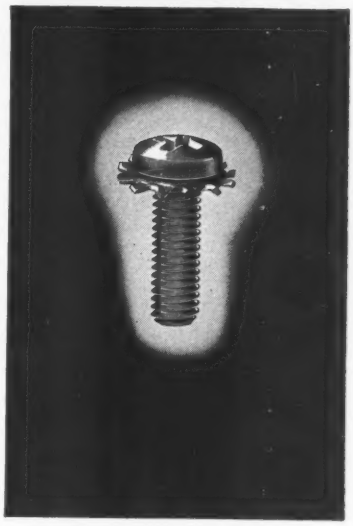
Washington—New order, M-92, has just been issued by the National Production Authority aimed at driving 2 million tons of steel from junked autos to the steel furnaces over the winter months. The order will force auto graveyard operators to dispose of their pre-1946 model autos and other wrecked cars. Of 7 million autos in wreckers' hands, NPA estimates about 4 million were built prior to 1946.

Under the new regulation tight inventory control on auto graveyards is set up. Operators are required to report by Dec. 20 the total number of car units and motor vehicles they held on Dec. 1 regardless of the year they were built. Operators also are required to list separately pre-1946 vehicles. NPA defines a car unit as either a car stripped to its salvageable parts, or 1500 pounds of loose scrap such as fenders, doors, springs and gears.

To remain in busines after Mar. 1, graveyard operators must sell to the mills and scrap dealers by that date at least as many cars and car units as they had pre-1946 cars and car units in their Dec. 1 inventories. They do not have to include cars built in 1946 and later in determining the number of cars and car units they must sell for scrapping purposes.

Boston—Temporarily heavy allocations on dealers have built up steel mill inventories, but not to the safe margin considered necessary at this season. Meanwhile, yard stocks are depleted and operations are on a hand-to-mouth basis. Drive scrap is coming out in fair volume, but considerable industrial steel scrap by-passes dealers, going direct to mills through special deals. Cast scrap is in spotty demand but most grades continue to move at ceiling prices.

Philadelphia—NPA, urging early shipments against allocated steel scrap tonnage, finds dealers shipping out volume in excess of intake in most cases with yard stocks depleted. While emergency allocations have tided mills over temporarily consumer



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stocks are well below the margin of normal safety. Practically all steel scrap moving is allocated with the reverse true of cast grades. Real test as to tonnage from automobile wrecking will come before Mar. 1.

Pittsburgh—Some district consumers are in fair shape as regards stocks. Others are operating on a hand-to-mouth basis. Mills here use approximately twice the amount of scrap that is generated in the area. This is one reason for the distressing supply conditions prevailing. Mills are hopeful that the present drive, aimed at getting industrial scrap on the market, will produce enough to tide them over this winter's crisis. Many purchasing agents say the scrap they are getting today is the worst they have ever seen. Consensus is that if the district's present high rate of steel production is to be maintained and new ingot capacity properly utilized, the flow of scrap to the mills will have to be materially increased.

Buffalo—Quiet tension dominates the scrap market. Mills are about holding their own as dealers are shipping light supplies. However, apprehension prevails over fresh allocation orders being placed here for outside shipment. What was expected to be a bumper season for water shipments, turned out to be one of poorest in receipts in many years. That, too, was undoubtedly due to allocations. Cast continues on the soft side.

Additional allocation orders for outside shipments on local dealers are thought likely in the near future. Mills here recently had about a 2½-weeks' inventory. Fears are expressed that points working on a closer margin will be taking material from this section.

Detroit—Mills report some improvement in scrap stocks. None are said to be in immediate danger of reduced operations from lack of scrap. Steel salesmen contacting companies to survey their properties for dormant scrap advise very few firms in this area have any substantial quantity. Hopes that this would root out a substantial tonnage have not been realized. The city is understood to be planning to take up a stretch of car tracks as an experiment to find out what the cost will be. It is estimated that 4000 tons of rail are idle and not paved over. Automakers are restudying the equipment and dies which had been marked "hold" to see whether more can be released to the drive.

Cincinnati—Scrap is moving to steelmakers in adequate tonnage, with allocations, to maintain capacity operations. But stocks are sufficient only for a few days. Blast furnace material is not seriously short, and foundries appear fairly well supplied.

Chicago—Despite favorable weather, flow of steelmaking scrap to district mills is little more than holding its own. The two plants of United States Steel Co. now average about a week's supply, having made a gain of a day or two. Allocations have been directed but receipts from this source are meager so far. Maintenance of steelmaking operations still hinges on what is ahead in weather conditions. Blast furnace grades and cast material for foundries are in good supply but move sluggishly.

Birmingham—Exceedingly tight is the term applied to the scrap market in this district. Agricultural scrap is moving in fair volume.

Los Angeles—With foundry actvity depressed 15 per cent, demand for scrap is weaker. Flow of steelmaking scrap to dealers is reduced by increasing practice of mills to buy scrap directly and haul it by truck from remote areas.

San Francisco—Report is circulating here to the effect 5000 tons of steel scrap will be allocated to the Seattle district from this area.

Seattle—Auto wreckers and NPA officals recently discussed a proposal that auto graveyards step up turnover of cars in their yards. Some wreckers think a proposed 90-day stock turnover period will work hardship on the industry, and put some firms out of business. It was pointed out cars are bought for scrapping mainly in summer, parts are sold in the fall and wrecking is done in December to March.

Warehouse . . .

Warehouse Prices, Page 155

Boston—Distributors are slower to take in wasters and other off grades. Mill offerings of wasters, rejects and over-runs are more frequent. While demand for structurals, bars and plates is heavy, overall pressure for steel from warehouse is easing.

New York—Warehouse order volume is restricted by lack of supplies of major carbon products. Some fourth quarter tonnage has been cancelled. Alloys are in better supply except nickel grades of stainless. Straight chromium grades are available in most cases. Warehouse allotments are frequently delivered two to three months late.

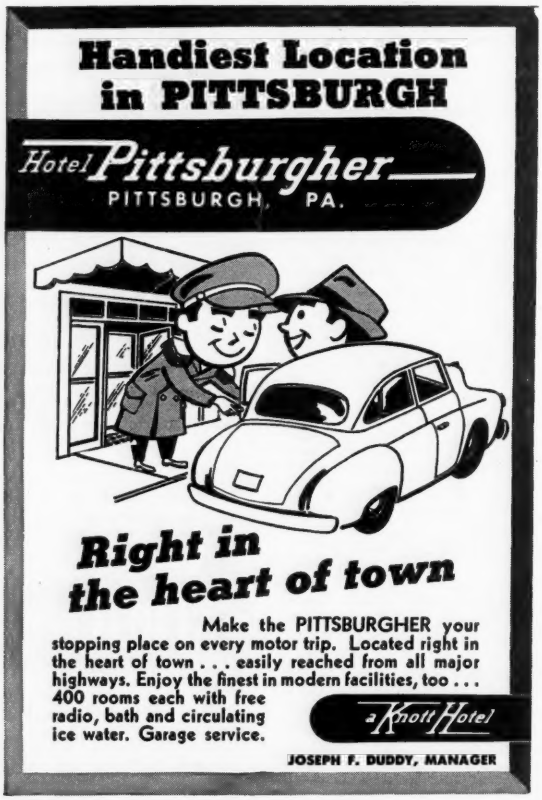
Philadelphia — Warehouse prices will change slightly under CPR 98. In any event competitive factors will establish levels for most products out of warehouse. Demand for standard carbon products, plates, shapes and bars is at high rate and mill deliveries against warehouse allocation are slightly improved the last two months of year, although on some products delays range up to two months.

Pittsburgh—Inventory position of district warehouses remains critical with receipts from mills disappointing. Most operators think CPR-98, which becomes effective Dec. 16, is equitable. Some sellers expect no price changes to result but others see some changes. Complaint over the additional paper work required is heard but all in all the order seems generally acceptable.

Chicago—Steel warehouses are in the throes of calculating new prices under CPR 98 and are not yet prepared to measure effect of the order. Demand for all products holds steady, with structurals, plates and cold-finished topping the list.

Birmingham—Warehouse supplies are on the short side. Distributors especially are harassed by inability to supply many comparatively small lot items in nails, lighter gage plates and sheets.

Los Angeles—Warehouse sales are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JOSEPH F. DUDDY, MANAGER

steady but new inquiries are depressed 50 per cent from October levels. Distributors approve of intent of new CPR 98 but say many amendments will be required to plug inequities and loopholes.

Seattle — Warehouse interests are pleased with clarification of the price situation afforded by CPR 98, which went into effect Dec. 16. Under the regulation higher freight costs can now be included in figuring prices. The order is regarded as a blow to gray market operations.

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Iron Ore . . .

Iron Ore Prices, Page 155

Cleveland—Shipments of Lake Superior iron ore for the 1951 season by vessel totaled 89,092,012 tons. This represents an increase of nearly 14 per cent over the 1950 total of 78,205,592 tons and is the second largest total in history. The all-time high of 91,612,753 tons was established in 1942.

Vessels of Pittsburgh Steamship Co.'s fleet, the largest on the lakes, carried more than 26 million tons to establish a new record. In addition, more than 7 million tons were moved in contract carriers, bringing to about 33.5 million tons the total ore movement for which Pittsburgh was responsible. This compared with a total movement of 30 million tons in 1950.

In lauding the industry's 1951 record, W. C. Hemingway, president of Pittsburgh Steamship, pointed out that only excellent weather made it possible. Close of the season was only three days later than in 1950, but shipping started three weeks earlier.

Shipments aggregated 790,730 tons in December compared with 5,695,281 tons in November and 872,638 tons in December, 1950.

Final figures for some of the ports are: Marquette, 4,771,928 tons; Ashland, 2,746,616 tons; Port Arthur, 1,325,349 tons.

Canada . . .

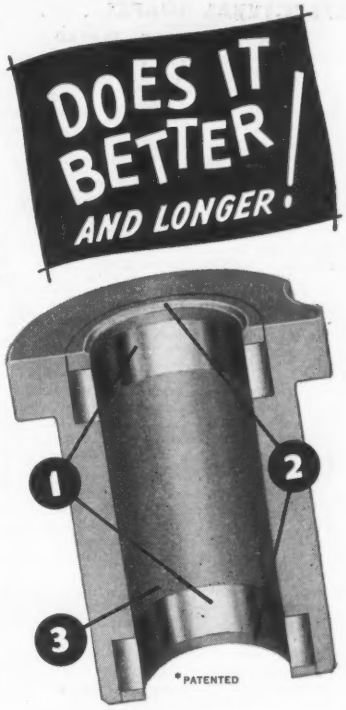
Montreal, Que.—V. M. Drury, president, Canadian Car & Foundry Co. Ltd., reports the company was successful in negotiating quantity orders for rolling stock in the year ended Sept. 30 but, in common with industry as a whole, car manufacture was curtailed by lack of materials.

Implementation of the defense program resulted in receipt of orders from the Department of Defense Production for production of Harvard aircraft, which is being undertaken at the company's Ft. William plant. Present orders for rolling stock should keep car plants in full operation through 1952, provided essential materials are available. Defense orders will keep aircraft and machine shop divisions wholly occupied beyond 1952.

Sault Ste. Marie, Ont.—Sir James Dunn, president, Algoma Steel Corp. Ltd., reports the company making progress with its $40 million expansion program. New installations are expected to be completed by mid-1953. The program includes a sintering plant; a 25-foot hearth blast furnace; rail and structural mill capacities doubled for production of heavy structural shapes.

For the year ended Apr. 30, 1951, Algoma produced 793,254 tons of steel, 1,025,185 tons of pig iron and 1,184,767 tons of coke, which compare with 802,448 tons of steel, 831,768 tons of pig iron and 1,040,765 tons of coke in the year immediately preceding.

Also during the year the company's subsidiary, Algoma Ore Properties, produced and sold 1,074,193 tons of sinter iron, a gain of more than 300,000 tons over the preceding year.



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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2300 tons, state highway bridges, Lancaster county, Pennsylvania, to Lehigh Structural Steel Co., Allentown, Pa.

500 tons (estimated) six spillway tainter gates and hoists for Detroit dam, to Guy F. Atkinson Co. as Willamette Iron & Steel Co., Portland, Oreg., low $517,959, by U. S. Engineer, Portland.

205 tons, building addition, Reed-Prentice Corp., Worcester, Mass., to Waghorne-Brown Co., Boston (Bethlehem Fabricators Inc., Bethlehem, Pa.), through E. J. Cross Co., Worcester, general contractor.

120 tons, state highway bridge, Colebrook-Lemington, N. H., to Bethlehem Steel Co.; Daniels Transportation Co., Lebanon, N. H., general contractor; 40 tons, reinforcing bars to Joseph T. Ryerson & Son Inc., Cambridge, Mass.

120 tons four I-beam bridges, Valdex district, for Alaska Road Commission, to West Coast Steel Works, Portland, Oreg., 34 tons reinforcing to Bethlehem Pacific Coast Steel Corp., Seattle; J. J. Badraun, Seattle, general contractor, low $219,625.

100 tons or more, class room building, Duke University, Durham, N. C., to Bethlehem Steel Co.; J. A. Jones Construction Co., Charlotte, N. C., general contractor; reinforcing bars to Easterby & MuMaw, Charlotte, N. C.

80 tons, two girder beams for state bridge near Port Townsend, Wash., to Puget Sound Bridge & Dredging Co., Seattle.

STRUCTURAL STEEL PENDING

23,000 tons, subway extension, Pitkin avenue, Brooklyn, N. Y.; Cayuga Construction Co., New York, low.

15,000 tons, elevated highway, South street, New York; Leonard Construction Co., New York, low.

4500 tons, bridge, Welfare Island-Brooklyn, N. Y.; bids in.

1050 tons, (if steel is approved) Army warehouses, Rainier Ordnance Depot, Washington state; bids to U. S. Engineer, Seattle, Dec. 20.

80 tons, switch equipment, Tacoma Light department; bids in.

Unstated, three spillway tainter gates and hoists, Big Cliff dam, Oregon state; bids to U. S. Engineer, Portland, Oreg., Dec. 27.

Unstated, penstock gates and guides, Detroit dam; Baldwin-Lima-Hamilton Corp., Eddystone, Pa., low $71,640, to U. S. Engineer, Portland, Oreg.

Unstated, penstock gate and hoist, Detroit dam; Northwest Marine Iron Works, Portland, Oreg., low $47,117 to U. S. Engineer, Portland.

Unstated, railroad bridge, Ship Creek, Alaska; A. J. Hopper Co., Seattle, low $174,999 to Alaska Railroad.

Unstated, Nenana river bridge and addition to Curry power plant; bids rejected by Alaska Railroad; to be readvertised.

REINFORCING BARS . . .

REINFORCING BARS PLACED

315 tons, state highway bridges, Harvard-Lancaster, Mass., to Truscon Steel Co., Boston; Bayer & Mingolla Construction Co. Inc., Worcester, Mass., general contractor.

REINFORCING BARS PENDING

3000 tons, Graves End housing project, Brooklyn, N. Y.; Paul Tishman Co., New York, low.

1000 tons, Boeing hangar Seattle; bids in Dec. 11.

225 tons, Saddle Gap pump plant, Columbia Basin project, involving switchyard structures, concrete siphon, 54-inch diameter, etc.; bids to Bureau of Reclamation, Denver, late December.

57 tons, five bridges, Mt. Baker National Forest, Washington; bids to Bureau Public Roads, Portland, Oreg., Dec. 18.

Unstated, Montana state railroad overpass, Benton road; bids to Helena, Dec. 20.

Unstated, three storage warehouses for Atomic Energy Commission; Sound Construction & Engineering Co., Seattle, low $925,813.

Unstated, two 100-foot and four 90-foot concrete slate highway bridges, Wheeler county, Oregon; bids to Portland, Dec. 21.

PLATES . . .

PLATES PENDING

250 tons, knockdown steel tanks, include eighty-seven 3000-barrel and ten 10,000 barrel, corps of engineers, Philadelphia; bids in.

200 tons, sheet steel piling, government-furnished, fishway protective works, McNary dam, Oregon; bids to U. S. Engineer, Walla Walla, Wash., Dec. 12.

200 tons, or more, 10,500 feet 30 inch water supply pipe; Hydraulic Supply Mfg. Co., Seattle, low $91,665 to Everett, Wash.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, system improvement Bend, Oregon; reported to Pacific States Cast Iron Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

400 tons, various sizes, Class 150 and 200, also accessories, for system improvement, total 35,000 feet; bids to Seattle, Dec. 13.

RAILS, CARS . . .

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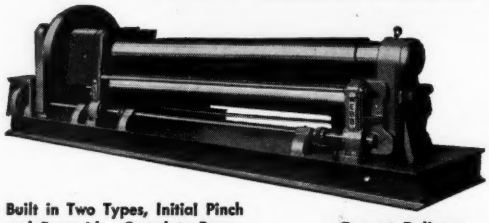

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Tube Firm Reorganizes

Babcock & Wilcox Tube Co., a wholly-owned subsidiary of Babcock & Wilcox Co., New York, will be dissolved, effective at the close of business Dec. 31. The tube company's business and assets will be absorbed by, and it will be operated as, one of the divisions of Babcock & Wilcox Co. The transfer of the plants and business of the tube company will have no effect upon its continued operation as far as the customers and employees of the subsidiary are concerned.

The tube facilities will be operated as the Tubular Products Division of the company and Luke E. Sawyer and Edward A. Livingstone, Tube company officers, will become officers of the parent company. The Babcock & Wilcox Tube Co. has its main offices at Beaver Falls, Pa., with plants in that city and in Alliance, O. It manufactures seamless and welded tubing in carbon, alloy and stainless steels.

Sanger Memorial Established

Purchasing Agents Association of Chicago established a memorial in the form of a $1000 college loaning fund in honor of the late John Pomeroy Sanger, vice president-purchases, United States Gypsum Co., Chicago, and past president of the association. The fund will be administered by authorities of Illinois Institute of Technology for the use of needy students.

Arvey To Double Production

Arvey Corp., Chicago, awarded a contract to H. K. Ferguson Co., Cleveland, for an expansion program that will double output of its chlorine and caustic soda plant in Memphis, Tenn. Cost will be about $2 million.

Elgin Buys Hadley Co.

Elgin National Watch Co., Elgin, Ill., purchased Hadley Co. Inc., Providence, R. I., manufacturer of metal watch bands and men's jewelry.

Convair Forms New Division

Consolidated Vultee Aircraft Corp., San Diego, Calif., established the firm's Ordnance Aerophysics Laboratory, Daingerfield, Tex., as a separate division of Convair. The move is expected to accelerate research and development work on ramjet-powered guided missiles. Convair had operated the laboratory since 1945 for the Navy Bureau of Ordnance, under the direction of Applied Physics Laboratory, Johns Hopkins University. J. E. Arnold, in charge of Daingerfield operations since 1945, has been named division manager. He will report to A. P. Fontaine, Convair vice president and general manager.

Dow Opens Los Angeles Unit

Dow Chemical Co., Midland, Mich., reinforced its position in the Southern California market by opening a Los Angeles harbor terminal for storage of 50 per cent concentrate caustic soda solution. The firm produces that product at its Pittsburg, Calif., plant.

Plans $35 Million Expansion

Caterpillar Tractor Co., Peoria, Ill., announced an expansion program that will include a new factory in York, Pa., extensive additions to the Joliet, Ill., plant, and some improvements in the Peoria plant. Major portion of the program will be financed with a long-term loan of $35 million. Planning layouts of the Joliet and York facilities have progressed far enough to permit the placing of orders for machine tools and equipment.

Minster Appoints Agency

Minster Machine Co., Minster, O., appointed Luther & Pedersen Inc., Chicago, as its Indiana representative for the sale of its mechanical power presses. Luther & Pedersen Inc. continues representation of Minster presses in Iowa, Illinois and Wisconsin.

Forms New Trade Association

A new trade association, American Rebuilders Association Inc., was organized which is establishing and maintaining standards in collaboration with the American Standards Association. Estimates of machine tools alone which are in dealers' hands and in industry, and which are capable of being rebuilt to standards are between 250,000 and 300,000. J. M. P. Fox is executive vice president of the association.

Pennsalt Expands Facilities

Beginning the second major step in development of its Calvert City, Ky., Works, Pennsylvania Salt Mfg. Co., Philadelphia, will add new facilities, including an electrolytic chlorine-caustic soda unit. Cost is estimated

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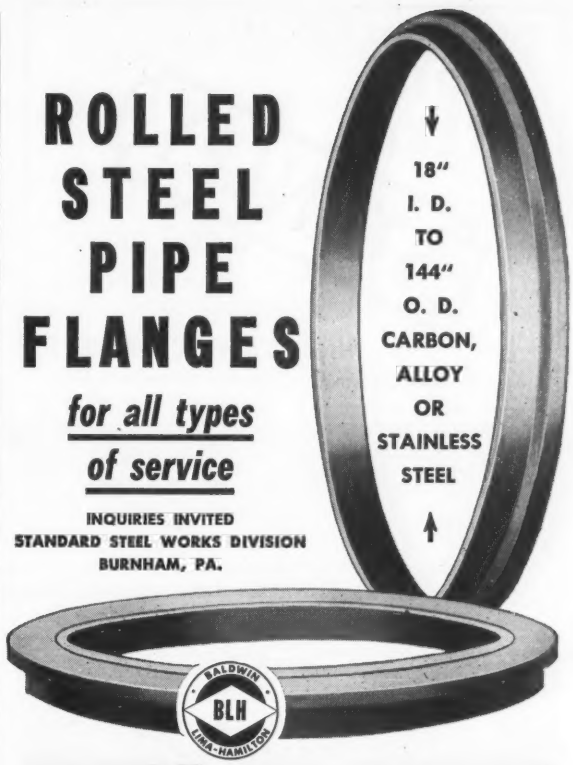

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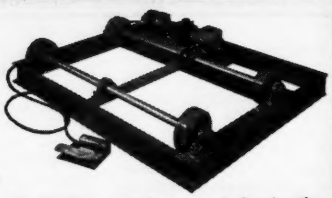

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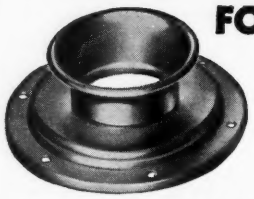

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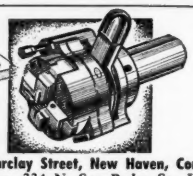

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at $8 million. Air Reduction Co., New York, is building a calcium carbide and acetylene plant in the same area. B. F. Goodrich Chemical Co., Cleveland, plans to build a vinyl chloride plant on property adjacent to that of both Pennsalt and Air Reduction.

Canadair Builds Warehouses

Canadair Ltd. will erect two warehouse buildings in Montreal with an additional 178,000 square feet of floor space. They are scheduled for completion by the end of May and will be easily convertible for factory use.

Erie Firm To Build Navy Tugs

American Boiler Works, Erie, Pa., received a $1.5 million defense order to build harbor tugs for the Navy. The firm built similar type vessels during World War II.

Lyon Celebrates Anniversary

Lyon Metal Products Inc., Aurora, Ill., celebrated its 50th anniversary this year. The company recently held a testimonial dinner for its Quarter Century Club members, commemorating their 5522 years of service.

Los Angeles Firms Merge

Hixson & Jorgensen Inc. bought Lockwood-Schackelford Co., both of Los Angeles. The companies will be merged under the name of Hixson & Jorgensen Inc. and office will be moved about Jan. 1 to the new building that Lockwood erected at 2001 Beverly Blvd., that city.

Promat Agent Appointed

Lasalco Inc., St. Louis, was appointed distributor for Promat Division, Poor & Co., Waukegan, Ill., manufacturer of chemicals for the electroplating industry.

Montreal To Get Engine Plant

Rolls-Royce Co. plans to build an engine plant at Montreal, Que., its first engine plant outside England. A. C. Morrall, the British firm's general manager in Montreal, said the $2 million plant would produce jet engines to power Canadian-built aircraft. The project is scheduled for completion in 1953.

Names Midwest Distributors

Metals Disintegrating Co. Inc., Elizabeth, N. J., manufacturer of metal pigments, powders and abrasives, appointed Daniel G. Hereley Co., Chicago, and J. W. Copps, Milwaukee, as distributors of aluminum pastes and powders and gold bronze powders in their respective territories. Metals Disintegrating Co. will continue to maintain direct contact with metal pigment users through its sales representative, John P. Halloran.

Baldwin-Hill Buys Plant

Baldwin-Hill Co., Trenton, N. J., acquired the Rockdale insulation plant near Housatonic, Mass. This purchase was made from Eagle-Picher Co., Cincinnati. The Rockdale plant will be operated to develop new Baldwin-Hill products as well as to manufacture and distribute its mineral wool insulating products in the New England territory.

Ziegler Opens Warehouse

Ziegler Steel Service Co., Los Angeles, is stocking aircraft quality sheet, strip and plate in alloy and carbon grades, in its recently established warehouse at 310 W. Third St., Wichita 2, Kans. Russell F. Meyer is manager of the Wichita Division.

Moves Chicago Branch Office

Hydraulic Press Mfg. Co., Mt. Gilead, O., moved its Chicago office to 3058 Peterson Bldg., Peterson avenue, Chicago. Don C. Youngblood continues as district manager.

Webb Opens L.A. Plant

Jervis B. Webb Co., Detroit, engineer and manufacturer of conveyors, opened a plant at 2650 E. Washington Blvd., Los Angeles, under the name Jervis B. Webb Co. of California.

American Iron Moves

American Iron & Supply Co. moved to a new and enlarged yard at 1500 E. 18th St., Erie, Pa. The firm is the successor to American Iron & Metal Co.

Baker Chemical Opens Plant

J. T. Baker Chemical Co. is placing in operation this month a new unit process plant at its Phillipsburg, N. J., Works. This is part of a $3 million expansion and modernization program, scheduled to be completed in 1952. The plant will boost production of many inorganic chemicals used in atomic energy, steel, munitions, electronics and many other industries.

Plans $10 Million Plant

Hooker Electrochemical Co., Niagara Falls, N. Y., plans to build a $10 million plant for the manufacture of chlorine and caustic soda at Montague, Mich.

Kaiser Distributor Expands

Earle M. Jorgensen Co., a distributor for industrial products of Kaiser Aluminum & Chemical Sales Inc.,

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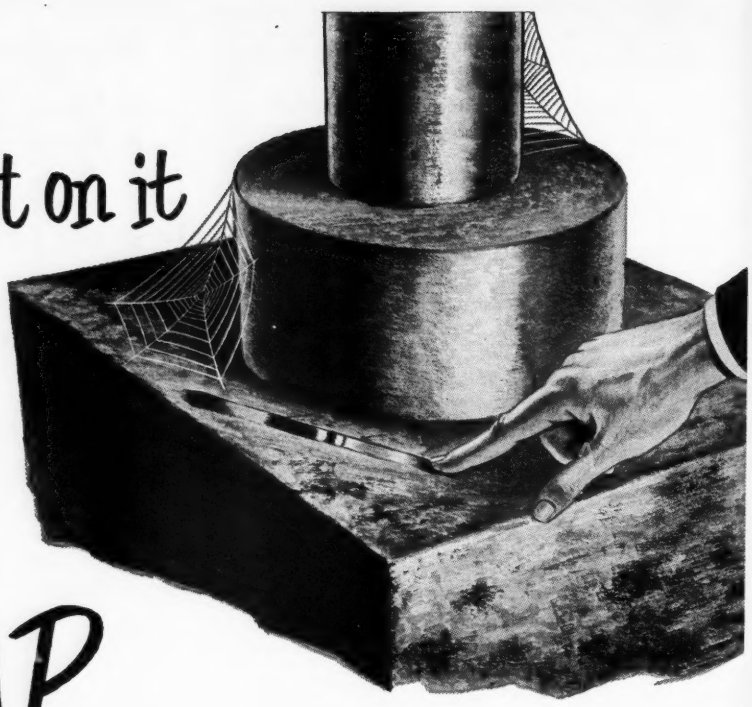
CINCINNATI 6, OHIO
Send at once my personal copy of the Fischer File.
Name _____ Title _____
Company _____
Address _____ City _____ Zone _____ State _____

If there's dust on it

it may be

precious scrap!



If it's SCRAP

it's needed to make STEEL!

One half of all the raw materials used in steel production is *scrap.*

Today, the mills aren't getting enough iron and steel scrap to keep up with greatly increased steel production.

AND WHAT IS SCRAP?

Scrap is many things. Here are three:

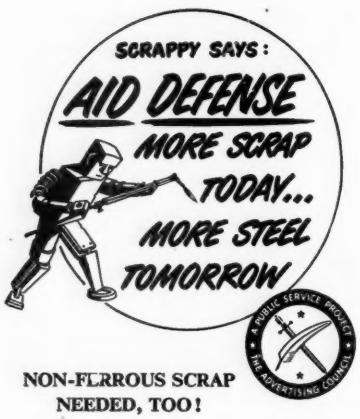
1. the "left-overs" of iron and steel production, fabrication and machining.
2. junked autos and old farm machinery.
3. obsolete iron and steel equipment in factories, such as old machinery, tools, dies, jigs, fixtures, chain, valves, etc.

But—the "left-overs" are not great enough today to fill the unprecedented demands for steel production.

And, with replacements scarce, less junked autos and farm machinery have entered the scrap supply lines.

So—only by digging out all the never-to-be-used odds and ends of broken, worn-out, and obsolete factory equipment . . . can mills and foundries get all the scrap they need.

If they don't get it, steel production rates may be severely hampered . . . and our country's effort to maintain military strength and civilian economy *at the same time,* will be crippled.



NON-FERROUS SCRAP NEEDED, TOO!

It's YOUR Job to Furnish More Scrap

Institute a steel scrap salvage program in your plant. Appoint one top official in your company to take full responsibility. Have him consult with your local Scrap Mobilization Committee and local scrap dealers. The nearest office of the National Production Authority, Department of Commerce, can tell you who your local Scrap Mobilization chairman is.

Do this now. Write for a copy of the booklet, "Top Management: Your Program for Emergency Scrap Recovery", to Advertising Council, 25 W. 45 St., New York 19, N. Y.

This advertisement is a contribution, in the national interest, by

STEEL

The Weekly Magazine of Metalworking

in Southern California, expanded its distributor service to include Northern California, Nevada and Utah. Warehouse stocks of aluminum will be maintained in Oakland. The Jergensen firm also distributes a complete line of steel products.

Albany Machine Shop Formed

Albany Steam Trap Co. Inc. was incorporated in Albany, N. Y., to engage in a machine shop business. The firm is located at 319 N. Pearl St. John Callahan is president and Charles Bakerman is general manager. A firm of the same name maintained a shop in Albany for about a century before it was dissolved.

Selectron Plant Planned

A plant designed for manufacture of Selectron, a polyester resin plastic, is being constructed at Springdale, Pa., for Pittsburgh Plate Glass Co.'s Paint Division.

Metal Firm Adds Facilities

Western Metal Spinning and Mfg. Co., Los Angeles, Calif., manufacturer of aircraft component parts and industrial and commercial sheet metal holloware, added new facilities at 2527 San Fernando Rd., Los Angeles.

Besly Transfers Division

Charles H. Besly & Co. will transfer, effective Jan. 1, its Industrial Supply Division to Barrett-Christie Co., both of Chicago. Besly will concentrate on manufacture of taps, grinders, drills, reamers and abrasive wheels. Barrett-Christie Co. will occupy the former Besly offices and stock rooms at 118 N. Clinton St., Chicago. Besly Cutting Tool Division will establish local stocks and Chicago area sales headquarters at 184 N. Wacker Dr., that city. The Besly executive office and Besly-Titan abrasive sales headquarters will move to 20 N. Wacker Dr. The national sales organization for grinders and cutting tools will be established at the Besly factory in Beloit, Wis.

Seabee Buying: Pots to Pumps, Saws to Scrapers

THE SEABEES (Naval Construction Forces) will spend over $21 million on equipment in fiscal 1952.

The spending breaks down thus: $3,025,463 for construction equipment; $9,259,010 for tactical automotive equipment; $8,151,461 for camp equipment; and $580,844 for shop equipment. Ten items of construction equipment, to be procured in varying quantities include compressors, tractors, pumps, mixers, cranes and scrapers. Among ten items of tactical automotive equipment are ambulances, cargo trucks, fuel trucks, truck tractors, trailers and jeeps.

Automotive shop equipment includes lubricating rigs, tire changers and gages. Sixteen types of shop equipment will be purchased in varying quantities. They include lathes, saws, drills, threading machines, cutting machines, joiners and splicers. Among 25 items of camp equipment scheduled for procurement are tents, tanks, distillation units, purification units, galley gear (pots, pans, stoves, etc.) and communication systems.

Purchase of Seabee equipment is made through the Navy's Yards & Docks supply office, Port Hueneme, Calif. Open bid and negotiated contracts are used for procurement. Under single service procurement, instituted by the Defense Department, the Navy buys such equipment as compressors, crawler cranes, pumps and mixers for all military users and the Army buys items such as tractors, scrapers and tactical automotive equipment.

SEABEE PROJECT: BUILDING AN AIRSTRIP
. . . they use tractors, scrapers, shovels, cranes

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Ductilite
THE MODERN TIN PLATE
LA BELLE CUT NAILS
WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

HOT DIP GALVANIZING
JOS. P. CATTIE & BROS., INC.
Gaul & Letterly Sts., Philadelphia 25, Pa.
GALVANIZED PRODUCTS FURNISHED RE 9-8911 PICKLING & OILING

OHIO LOCOMOTIVE CRANES
GASOLINE • DIESEL
ELECTRIC • STEAM
25 TO 40 TON CAPACITY
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COPPER?
Aluminum?
brass?
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which alloy for your fastenings?

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Gondolas, Composite or All Steel, 50-Ton and 70-Ton
Gondolas, All-Steel, 55-Ton, Solid Bottom
Hoppers, Covered, All-Steel, 50-Ton & 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 8,000-Gallon, Class II

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End Dump, 20-Yd., 50-Ton Drop Door
End Dump, 10-Yd., 30-Ton, Lift Door
Side Dump, 16-Yd., 30-Ton Lift Door

STANDARD GAUGE LOCOMOTIVES

Two Plymouth Diesel-Electric, 45-Ton, Standard Gauge, Type 0-4-4-0, Built 1942
Gasoline—10-Ton to 25-Ton
Gasoline-Electric—35-Ton
Diesel-Mechanical—8-Ton to 30-Ton
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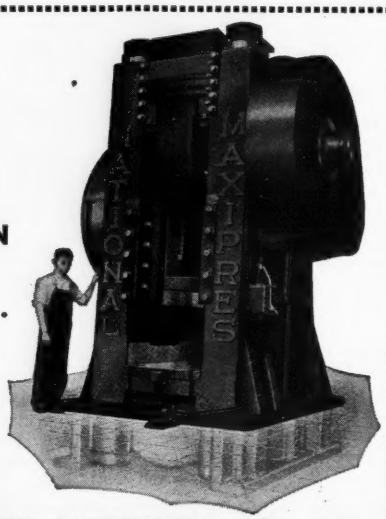

SPECIFICATIONS:

Stroke	14"
Dia. of crank	14"
F. to B.	42"
R. to L.	38"
Approx. Weight	185,000 lbs.

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21/32"	Rd. 10/12'	51100	14250#
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HOT ROLLED BARS			
1-3/16"	Rd. 10/12'	52100	7000#
3½"	Rd. 10/12'	52100	3400
3¼"	Rd. 10/12'	4320	1500
5"	Rd. 10/12'	4320	1100
CORE RODS			
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7/16" Rd.	H.R.	14' Len.	8000

SEABOARD STEEL CO., INC. New Haven, Conn.

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H.W.T. 250 lb. pressure
Boilers in good condition
Priced right
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FOR SALE

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Model A Kearney & Trecker Autometric Jig Borer Ser. 16-4052. Note this is a horizontal not vertical machine. Condition like new.

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When you have machinery or equipment you want to sell—STEEL can help you. For rates, write STEEL, Penton Bldg., Cleveland 13, Ohio.

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12/20' Long
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Send Lists of Other Machinery You Have for Sale.
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Help Wanted

CLEANING ROOM FOREMAN
Experienced foreman for miscellaneous and semi-production steel foundry. Must have thorough knowledge of heat treating. Excellent opportunity for right person. Good salary, insurance, and bonus. State qualifications and expected salary. Location—Detroit area. Write Box 364, STEEL, Penton Bldg., Cleveland 13, O.

SALESMEN WANTED
Now calling on electroplaters, metal and machinery manufacturers to sell first quality imported industrial plating and degreasing chemicals (nickel sulfate, potassium cyanide, trichloroethylene, etc.). On Commission basis as sideline. Replies confidential. Write Box 408, STEEL, Penton Bldg., Cleveland 13, O.

WANTED—MELTING DEPARTMENT SUPERintendent. Immediate opening for person having experience in electric arc furnace melting of tool, high speed, stainless, and specialty steels in long-established mill in Pittsburgh district. Should have considerable practical experience, technical background, and ability for handling men. Reply giving complete record of experience, qualifications, age, and references. Write Box 380, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: ASSISTANT CHIEF ENGINEER for steel plant located in eastern section of country. Opportunity. Write Box 412, STEEL, Penton Bldg., Cleveland 13, O.

Representatives Wanted

MANUFACTURERS REPRESENTATIVE WANTED
California Territory
Company making metal stampings in small lots has exclusive territories open in the Los Angeles and San Francisco areas. Applicants should have a working knowledge of die practice.
Write Box 417,
STEEL, Penton Bldg., Cleveland 13, Ohio

Employment Service

SALARIED Positions $3,500 TO $35,000. WE offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

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PLANT MANAGER WITH PROVEN ABILITY handling all phases of manufacturing in a plant making heavy machinery wants to contact owner who needs capable manager. Present salary $10,000. Write Box 414, STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

WORKS MANAGER WANTED

Graduate engineer about 40 years old for small steel plant in Eastern part of United States. Must have rolling mill experience. Electric furnace operation experience also helpful. Send complete information including salary required in first letter. Applications will be held in strict confidence.

Our own employees know of this advertisement.

Reply to Box 418,
STEEL, Penton Bldg., Cleveland 13, O.

SALES ENGINEERS

Established well known highly regarded middle west heavy machinery manufacturing company wishes to add several sales engineers to its staff. Will sell quality products to industrial organizations. Candidates should be engineering graduates and have successful sales engineering experience. Age 25 to 35. We are seeking only those who possess ambition and leadership qualities. There are unusual opportunities for advancement. Your reply confidentially respected.

Write Box 416,
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WANTED

Preferable, but not necessary, a technically trained mechanical engineer, age 50 to 55 years, to fill a high executive position with a steel company. It is necessary that the applicant for the position has steel plant operating experience and thoroughly understands the operations of the various departments of a modern up-to-date equipped steel plant. Our executive officials and division superintendents know of this advertisement, all repies will be held in confidence. Write Box 415, STEEL, Penton Bldg., Cleveland 13, O.

QUALIFIED STRUCTURAL AND PLATE Draftsman to take charge of a small drafting force in a Western New York fabricating plant. Write for interview giving resume of past 10 years' experience. All replies confidential. Address Box 411, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: LUBRICATION ENGINEER FOR steel plant located in Eastern section of country. Opportunity for right individual. Write Box 413, STEEL, Penton Bldg., Cleveland 13, O.

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2,000 Tons Per Month
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Large eastern structural steel fabricator with capacity of 2,000 tons per month has immediate open capacity for fabrication of structural steel or structural shapes, weldments, trusses, plate girders—riveted or welded, beams, columns. Materials to be supplied by you. Send blue prints or inquiries for quick action.

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10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
New Haven, Conn.
Makers of H & G Die Heads

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ¾" Pl.
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PRODUCTION ADVANTAGES

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SPECIFY WYCKOFF

COLD FINISHED STEEL

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FIRST NATIONAL BANK BUILDING
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Farval pays for itself quickly, many times over

...saving oiling labor
...saving lubricant
...saving bearing expense
...saving production time

WITH Farval you lubricate your machinery or equipment mechanically. Farval does the job quickly and dependably.

Any type of bearing surface, enclosed or open, can be Farval-lubricated with grease or oil. Measured charges of lubricant are metered to each bearing through the unique Dualine Valve, delivered under pressure from a central reservoir, either by a manually operated pump or one actuated by an automatic time-clock mechanism.

Farval is not a new idea. It has proved its value in service over a 23-year period, protecting millions of bearings in every phase of industry—in manufacturing plants, mining and quarrying operations, transportation—wherever there are bearings that have to be lubricated. Thousands of installations on mills, presses, conveyors, cranes, engines and other industrial equipment provide records of money saved. Savings take four forms:

1. Labor saving—Farval eliminates hand oilers. Minimum attention only is required—to inspect system, refill lubricant reservoirs, etc.

2. Lubricant saving—Correct amounts are used without waste, frequently reducing oil or grease consumption as much as 75%.

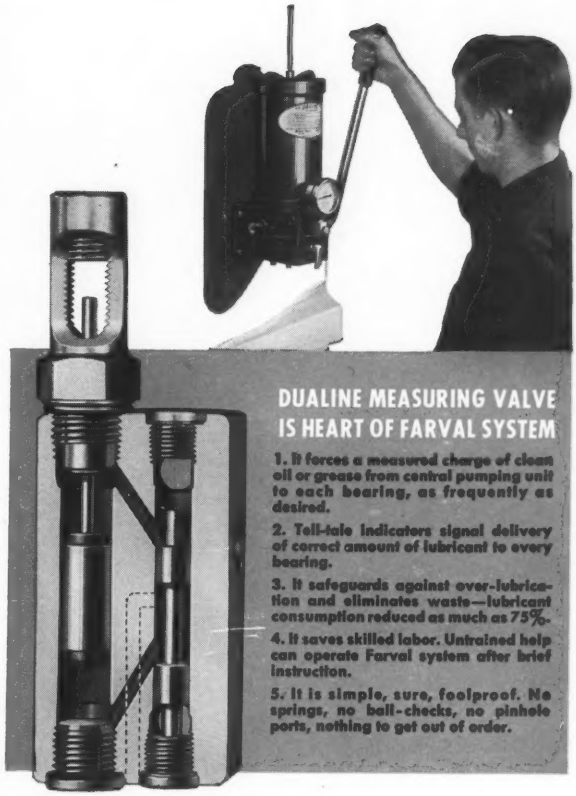
3. Bearing expense saving—No more burned out or damaged bearings with Farval protection. Expense of replacement eliminated.

4. Production time saving—Farval lubricates while equipment is running. No shutting down to oil. No taking a machine out of production to repair or replace bearings.

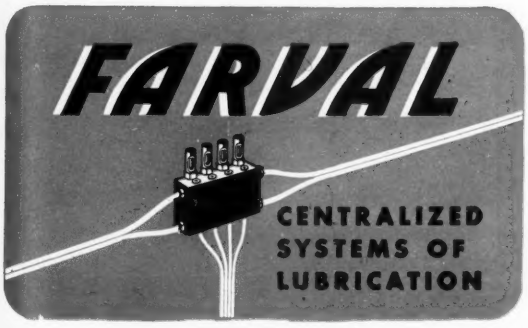
In short, savings are so positive that you soon recover the entire cost of a Farval system—and savings continue as extra dividends.

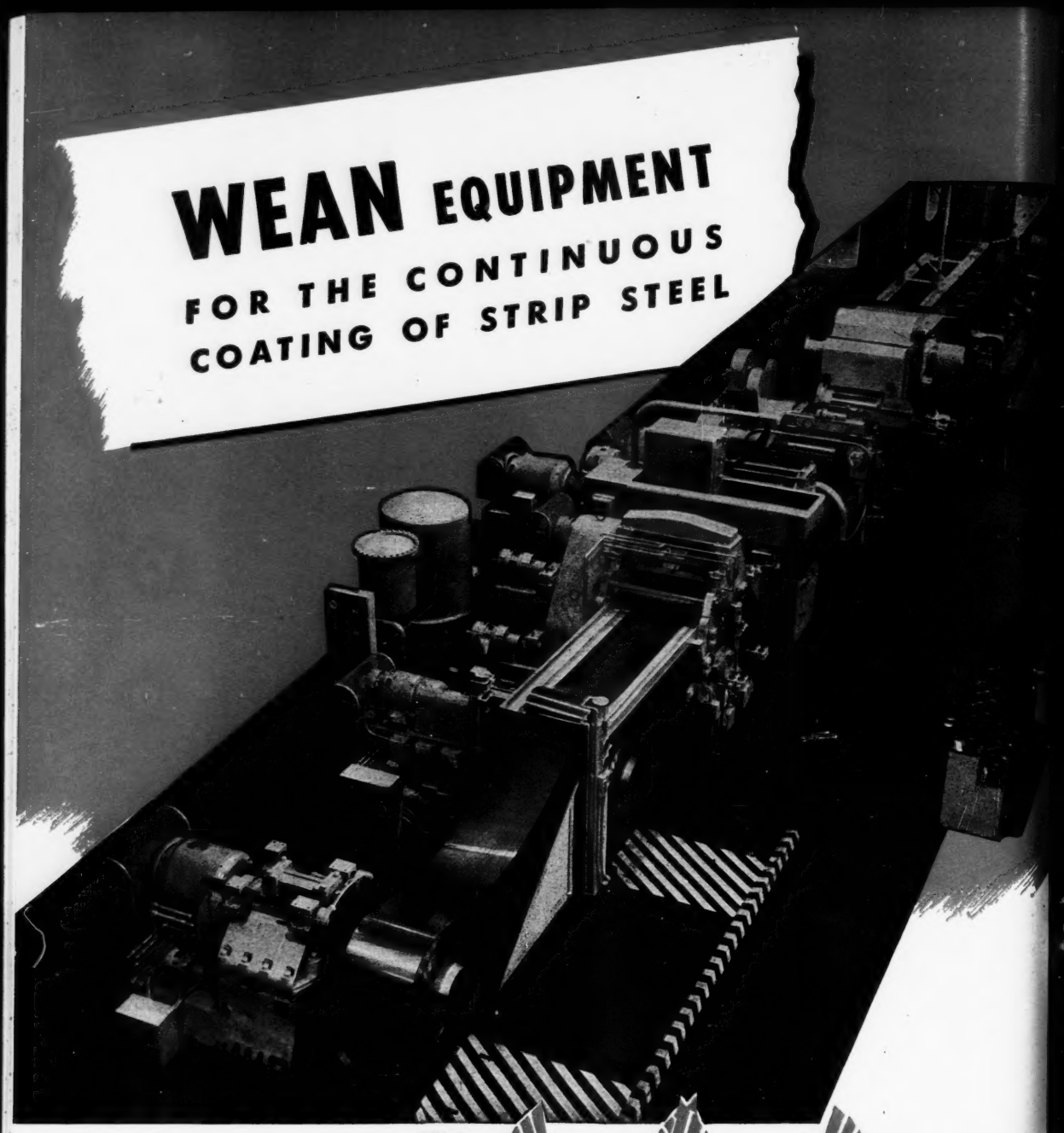
If you want figures on savings possible with Farval on the types of machines you operate, just write us. Tell us what equipment you have and ask for Bulletin 25. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.


DUALINE MEASURING VALVE IS HEART OF FARVAL SYSTEM
1. It forces a measured charge of clean oil or grease from central pumping unit to each bearing, as frequently as desired.
2. Tell-tale indicators signal delivery of correct amount of lubricant to every bearing.
3. It safeguards against over-lubrication and eliminates waste—lubricant consumption reduced as much as 75%.
4. It saves skilled labor. Untrained help can operate Farval system after brief instruction.
5. It is simple, sure, foolproof. No springs, no ball-checks, no pinhole ports, nothing to get out of order.

FARVAL—*Studies in Centralized Lubrication* No. 122





THE Wean Engineering Company is meeting today's demands for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated black plate and strip steel. Equipment for coating strip steel with zinc and other materials by the hot dip method is also available.

The WEAN ENGINEERING COMPANY, Inc.
Warren, Ohio

Associate Company—Wean Equipment Co.—Cleveland, Ohio

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT